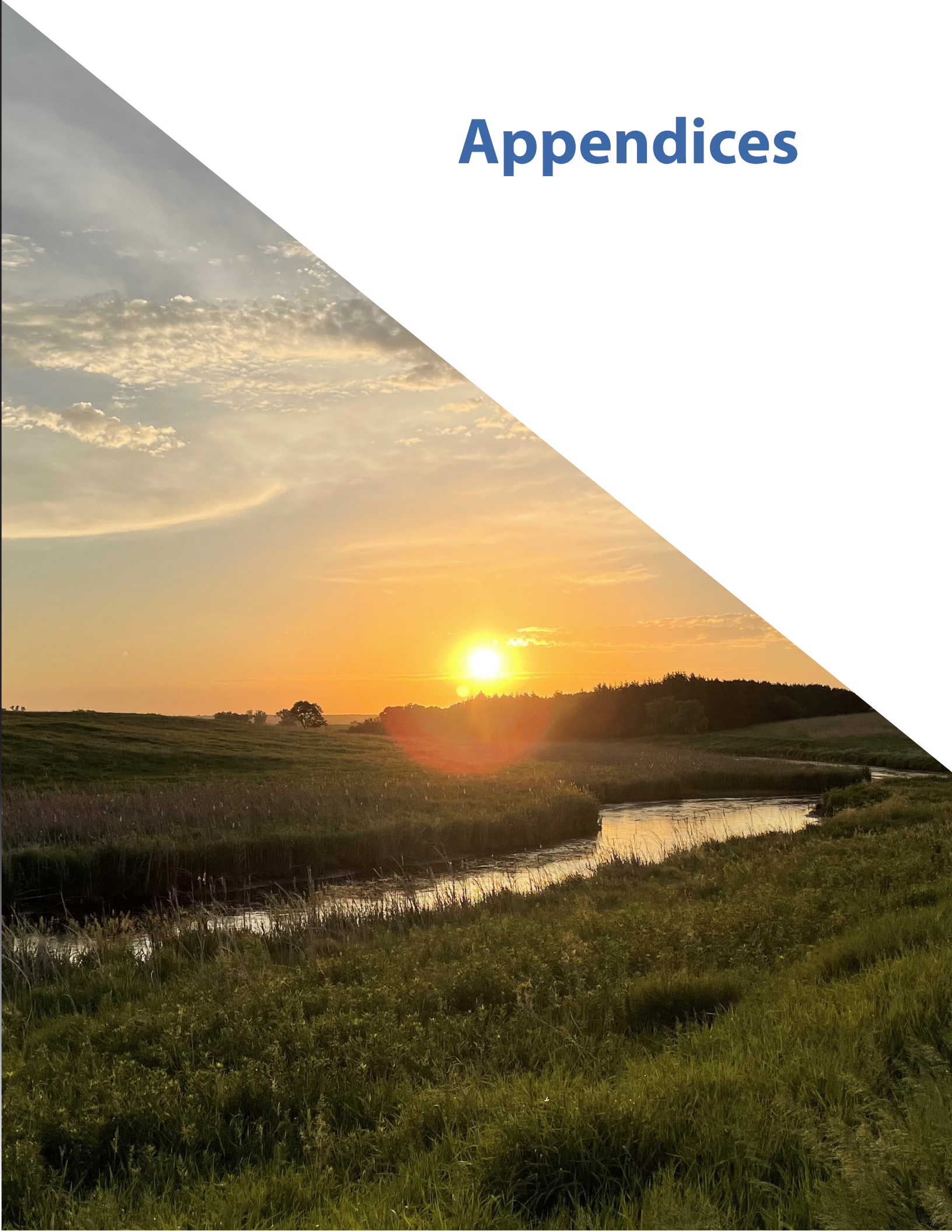
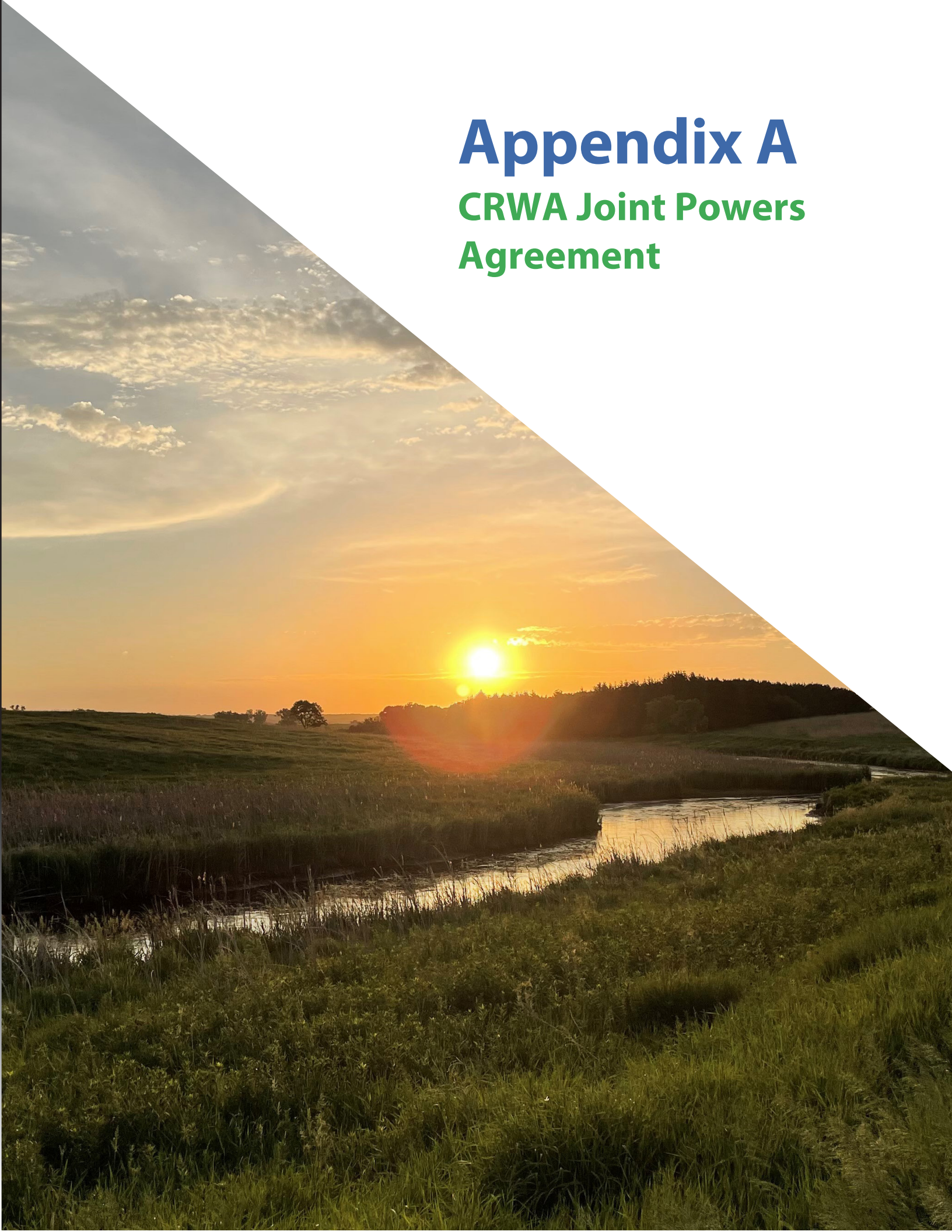
Appendices



Appendix A

CRWA Joint Powers Agreement



Chippewa River Watershed Association
Joint Powers Agreement

Article 1
Enabling Authority

THIS AGREEMENT is made by and between the political subdivision organized and existing under the Constitution and laws of the State of Minnesota, hereafter collectively referred to as "Parties", and individually as "Party" which are signatories to this "Agreement."

Minnesota Statutes, Section 471.59 provides that two or more governmental units may by Agreement jointly or cooperatively exercise any power common to the contracting Parties or any similar powers including those which are the same except for the territorial limits within which they may be exercised. The Agreement may provide for the exercise of such powers by one or more of the participating governmental units on behalf of the other participating units. The term "governmental unit" as used in this section includes every city, county, town, school district, other political subdivision of this or any adjoining state, and any agency of the State of Minnesota or the United States, and includes any instrumentality of a governmental unit, meaning an instrumentality having independent policy making and appropriating authority.

In consideration of the mutual promises and Agreements contained herein and subject to the provisions of Minnesota Statutes, Sections 471.59 and all other applicable statutes, rules and regulations, the following Parties:

Chippewa County, Douglas County, Grant County, Kandiyohi County, Pope County, Stevens County, Swift County, Otter Tail County, Chippewa Soil and Water Conservation District (SWCD), Douglas SWCD, Grant SWCD, Kandiyohi SWCD, Pope SWCD, Stevens SWCD, Swift SWCD, and West Otter Tail SWCD.

hereto agree as follows:

Article 2
Purpose

The purpose of this Agreement is the joint exercise of powers by the undersigned Parties to develop and implement plans to promote the orderly water quality improvement and management of the Chippewa River Watershed through information sharing, fund seeking, education, coordination and related support to the members with regard to the protection of property from damage of flooding, controlling erosion of land; the protection of property, streams and lakes from sedimentation and pollution; and maintaining and improving the quality of water in the streams, lakes and ground water and improving recreation and wildlife and same in accordance with the intent of Section 471.59 of Minnesota Statutes.

A. Coordinate with local, state, and federal agencies to encourage landowners to voluntarily change their land use practices to improve the quality of soil and water resources within the Chippewa River Watershed.

B. Provide other similar or related services and programs as determined by the Board.

C. Establish a mechanism whereby additional and/or alternative programs and services may be developed for the benefit of the Parties and in furtherance of the objectives of the Parties.

D. Collectively develop and adopt a coordinated watershed management plan for implementation per the provisions of the plan.

Article 3
Name

The name of this joint powers entity shall be Chippewa River Watershed Association hereinafter referred to as CRWA.

Article 4
Agreement to Participate

4.1 Members. The members under this agreement are those Counties and SWCDs lying within the boundaries of the watershed of the Chippewa River, namely, Chippewa County, Douglas County, Grant County, Kandiyohi County, Pope County, Stevens County, Swift County, Otter Tail County, Chippewa SWCD, Douglas SWCD, Grant SWCD, Kandiyohi SWCD, Pope SWCD, Stevens SWCD, Swift SWCD, and West Otter Tail SWCD. The following table is a breakdown of counties within the Chippewa River Watershed.

County	Acres	% of the Watershed
Chippewa	206,692	15%
Douglas	187,367	14%
Grant	24,261	2%
Kandiyohi	96,031	7%
Ottertail	19,532	1%
Pope	394,365	29%
Stearns	18	0%
Stevens	53,749	4%
Swift	388,435	28%
Total	1,370,450	100%

4.2 Compliance. A Party agrees to abide by the terms and conditions of the Agreement; including but not limited to the Joint Powers Agreement, bylaws, policies and procedures adopted by the Board.

4.3 Financial Obligation. In addition to grant funding received, members may provide additional direct funding as they may determine from time to time. In addition to, or in lieu of financial support, the members may also contribute services, personnel, or personal property to the CRWA in such amounts as the members may determine from time to time.

4.3.1 Host County. The County hosting the CRWA office may make its contribution in the form of in-kind donations through office space and use of office equipment and supplies.

Article 5
Governance

5.1 Governing Board. A governing board shall be formed to oversee the operation of the CRWA and shall be known as the Board.

5.1.1 Membership. The Board shall be comprised of one representative of each County Board of Commissioners and one elected representative of each Soil and Water Conservation District Board of Supervisors included in this agreement. Each member shall have one equal vote.

5.1.2 Qualifications. Each member of the Board shall be member of each respective unit of government and shall be appointed by the respective unit of government.

5.2 Terms; Vacancies. The term of appointment shall be set by the respective unit of government. The appointing entity shall appoint a designee as soon as a vacancy occurs.

5.3 Officers of the Board. The Board shall elect a Chair, Vice Chair, Secretary/Treasurer from its membership who shall serve two-year terms. The Vice Chair shall assume the role of chair during temporary absence or disability of the chair. Should the Chair be succeeded by another appointee during their term of office, the Vice Chair shall serve as Chair until the expiration of the elected Chair's term. Should both positions be succeeded prior to the expiration of their terms in such offices, the Board shall elect a new Chair and Vice Chair to serve until the following January meeting. Should the office of Secretary/Treasurer become vacant due to disability or succession the Board shall by majority vote to appoint the successor (s). The Chair shall preside at all meetings of the Board, if present, and shall perform all other duties and functions usually incumbent upon such an officer and all administrative functions usually assigned to them by the Board. The Vice Chair, Secretary, and Treasurer shall perform such duties and functions usually incumbent upon such an officers and all other functions assigned to them by the Board.

5.3.1 Election of Officers. The election of the Officers shall be conducted at the first meeting following January 1 of each odd-numbered year.

5.3.2 Executive Board. The executive board herein shall by majority vote, have the power between meetings to implement ministerial, as opposed to policy, decisions. Said executive board members shall consist of the officers listed in subdivision 5.3, i.e. Chair, Vice Chair, and Secretary/Treasurer. A quorum of the Executive Board shall consist of a simple majority of the members of the Executive Board.

5.3.3 Committees. The Board shall have the authority to appoint such committees as it deems necessary to fulfill the purpose of the organization.

5.4 Meetings. The Board shall comply with the Minnesota Statutes Chapter 13D (Open Meeting Law). The Board will meet as set by the Board each year.

5.5 Voting. A quorum shall consist of a simple majority of the voting members of the Board. Board actions shall be determined by a majority of the votes cast at the meeting. Abstentions shall not be counted as votes cast for the purpose of this section. Proxy votes are not permitted.

5.6 By-Laws. The Board may adopt bylaws to govern its operations. Such bylaws shall be consistent with the Agreement and applicable law.

5.7 Amendments. This Agreement may be amended from time to time as deemed necessary.

5.8 Records, Accounts and Reports.

5.8.1 Records and Reports. The books and records, including minutes and the original fully executed Agreement, of the Board shall be subject to the provisions of Minn. Stat. Ch. 13. They shall be maintained at the office of the host.

5.8.2 Receipts and Disbursements. The CRWA will ensure strict accountability for all funds of the organization and will require reports on all receipts and disbursements made to, or on behalf of the CRWA.

5.8.3 Audits. The Board shall have an annual third-party audit of the books and accounts of the CRWA and shall make a report to its Members at least once each year.

Article 6
Powers of the Board

6.1 General Powers. The Board is hereby authorized to exercise such authority and powers common to the Parties as is necessary and proper to fulfill its purposes and perform its duties. Such authority shall include the specific powers enumerated in this Agreement or in the bylaws.

6.2 Specific Powers.

6.2.1 Employees. The Board may employ, train, pay, discipline, discharge and otherwise manage personnel needed to assist the CRWA Board in carrying out its duties and responsibilities. Employees of the Board shall not be considered employees of the Parties to this Agreement for any purpose including, but not limited to, salaries, wages or other compensation or fringe benefits; worker's compensation; unemployment compensation or reemployment insurance; retirement benefits; social security; liability insurance; maintenance of personnel records and termination of employment.

6.2.2 Contracts. The Board may enter into contracts necessary for the exercise of its duties and responsibilities to govern the CRWA. The Board may take such action as is necessary to enforce such contracts to the extent available in equity or at law. Contracts and/or agreements let, and purchases made pursuant to this Agreement shall conform to the requirements applicable to contracts and/or agreements required by law (i.e. fiscal management, personnel management).

6.2.3 Annual Budget. That the CRWA will operate on grants obtained to carry out its purposes pursuant to Article 2. The annual budget will be dependent on work plans and budgets tied directly to grant agreements. All grant agreements and associated work plans and budgets will be approved by the Board and executed by the Board Chair at any time they are received.

6.2.4 Insurance. The Board shall obtain equipment, general liability, public employee's liability, employee dishonesty and faithful performance, workers' compensation, property, and auto insurances and may obtain such other insurance it deems necessary to indemnify the Board and its members for actions of the Board and its members arising out of this Agreement.

6.2.5A Watershed Management Plan. Submittal of the Plan. The CRWA will recommend the plan to the parties of the Agreement. The CRWA will be responsible for initiating a formal review process for the watershed-based plan conforming to Minnesota Statutes Chapters 103B and 103D, including public hearings. Upon completion of local review and comment, and approval of the plan for submittal by each party, the CRWA will submit the watershed-based plan jointly to the Minnesota Board of Water and Soil Resources (BWSR) for review and approval.

6.2.5.B. Adoption of the Plan. The parties agree to adopt and begin implementation of the plan within 120 days of receiving notice of state approval, and provide notice of plan adoption pursuant to Minnesota Statutes Chapters 103 B.

6.3 Additional Resources.

6.3.1 In-kind and direct contributions. The CRWA established by this Agreement may also be funded by in-kind and direct contributions. Member counties may provide additional funding in such proportionate amounts from among themselves, and in such total amounts, as they may determine, from time to time. In addition to financial support, the members may also contribute services, personnel, or personal property to the CRWA in such amounts as the members may determine from time to time. Each member is not expected to make any individual contribution unless it is approved by the members.

6.3.2 The CRWA may apply for and accept gifts, grants, or loans of money or other personal property from the United States, the State of Minnesota, or any other body, organization, political subdivision, or person, whether public or private. The Board may enter into any agreement required in connection therewith, and hold, use, or dispose of any such money or other property in accordance with the terms of the gift, grant, loan or agreement relating thereto.

Article 7
Indemnification and Hold Harmless

7.1 Applicability. The CRWA shall be considered a separate and distinct public entity to which the Parties have transferred all responsibility and control for actions taken pursuant to this Agreement. CRWA shall comply with all laws and rules that govern a public entity in the State of Minnesota and shall be entitled to the protections of Minnesota Statutes 466.

7.2 Indemnification and Hold Harmless. The CRWA shall fully defend, indemnify and hold harmless the Parties, employees, and officials against all claims, losses, liability, suits, judgments, costs, and expenses by reason of the action or inaction of the Board and/or employees and/or the agents of the CRWA. This Agreement to indemnify and hold harmless does not constitute a waiver by any participant of limitations on liability provided under Minnesota Statutes, Section 466.04.

To the full extent permitted by law, actions by the Parties pursuant to this Agreement are intended to be and shall be construed as a "cooperative activity' and it is the intent of the Parties that they shall be deemed a 'single governmental unit' for the purpose of liability, as set forth in Minnesota Statutes Section 471.59, Subd. 1 a(a); provided further that for purposes of that statute, each Party to this Agreement expressly declines responsibility for the acts or omissions of the other Party.

The Parties of this Agreement are not liable for the acts or omissions of the other participants to this Agreement except to the extent to which they have agreed in writing to be responsible for acts or omissions of any other Parties.

Article 8
Withdrawal and Termination

8.1 Withdrawal. A Party shall have the right to withdraw from this agreement and association hereby created, in the following manner:

8.1.1 The board of the withdrawing Party shall pass a resolution declaring its intention to withdraw on December 31 and shall send a certified copy of such resolution to the Chair of the CRWA Executive Board at least 6 months prior notice.

8.1.2 Upon receipt of the resolution of withdrawal, the Chair of the CRWA Board shall send a copy of said resolution to each Party's Board.

8.1.3 Withdrawal by a Party shall not result in the discharge of any legal or financial liability incurred by such Party before the effective date of withdrawal. All such liabilities shall continue until properly discharged or settled by the withdrawing county to the approval of the remaining member counties, which approval shall not be unreasonably withheld.

8.1.4 A withdrawing Party shall not be entitled to a refund of funds paid, or forgiveness of funds owed to the CRWA prior to the effective date of withdrawal. A withdrawing member shall not be entitled to the return of any personal property, given, granted or loaned by it to the CRWA unless specified by written agreement.

8.2 Effective Date and Obligations. This Agreement and the CRWA created hereby, shall continue indefinitely in full force and effect until all member Parties, or all remaining member Parties, mutually agree to terminate the Agreement by joint resolution passed by the member Parties respective Boards. This Agreement once approved by the parties will replace the current CRWA agreement.

8.3 Termination. The termination of this Agreement shall not act to discharge any liability incurred by the Board or by the Parties during the term of the Agreement. Each member shall continue to be responsible for its actions, debts, and duties to the extent required by federal, state, and local law. All property, real and personal, held by the CRWA at the time of its termination, shall be distributed by resolution to the member Counties by percentages pursuant to Article 4.1 The CRWA and the Executive Board shall finally terminate and cease to exist upon the approval of a final report of the Executive Board declaring that all the affairs and obligations of the CRWA have been discharged or otherwise properly concluded.

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

7/22/2020
Date

COUNTY OF CHIPPEWA

Board Chair

7-21-20
Date

ATTEST Michelle May
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

7/6/2020
Date

CHIPPEWA SWCD

Board Chair

7-6-20
Date

ATTEST Michelle Mary
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5/19/2020

Date

COUNTY OF DOUGLAS

Board Chair

5/19/2020

Date

ATTEST

County ~~Auditor or Administrator~~ Coordinator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

10/20/2020
Date

DOUGLAS SWCD

Paul Barsness
Board Chair

6-8-20
Date

ATTEST
~~County Auditor or Administrator~~
SWCD Coordinator
6-8-20

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

6/5/2020
Date

COUNTY OF GRANT

Board Chair

6-2-2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

6/11/2020
Date

GRANT SWCD

Board Chair

5/28/2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

6-5-2020
Date

COUNTY OF KANDIYOHI

Board Chair

6-2-2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5-29-2020
Date

KANDIYOHI SWCD

Board Chair

6.16.2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5-5-2020
Date

COUNTY OF POPE

Board Chair

5-5-2020
Date

ATTEST
County ~~Auditor or Administrator~~ Coordinator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5-26-2022
Date

POPE SWCD

Board Chair

4-21-22
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5/11/2020
Date

COUNTY OF STEVENS

Board Chair

5-5-20
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

7/14/2020
Date

STEVENS SWCD

Board Chair

6/9/2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5/15/2020
Date

COUNTY OF SWIFT

Board Chair

5-5-2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5/19/2020
Date

SWIFT SWCD

Board Chair

5-14-2020
Date

ATTEST

County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

4/30/2020
Date

COUNTY OF OTTER TAIL

Board Chair

4-28-2020
Date

ATTEST
County Auditor or Administrator

Article 9
Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. Counterparts shall be filed with the host of the CRWA who will maintain them at the CRWA host office.

In witness whereof, the undersigned governmental units, by action of their governing bodies, have caused this Agreement to be executed in accordance with the authority of Minnesota Statute 471.59.

APPROVED AS TO FORM:

County Attorney

5/30/2020
Date

WEST OTTER TAIL SWCD

Rodney a. Wenthen
Board Chair

5-11-20
Date

ATTEST 6/3/20
County Auditor or Administrator

Appendix B

Public Kickoff Meeting Feedback

Chippewa River Comprehensive Watershed Management Plan

Public Kickoff: Activity Results

On April 5, 2022, the Chippewa River Watershed Association hosted a public meeting to kick off the Chippewa River Watershed One Watershed, One Plan planning effort. During the event, participants were asked to "vote" on the issues they thought were most important, using sticky dots. The result of those votes is shown below. The first table is organized by issue category, with issues listed in no order of priority. The second table lists the issues in level of priority, as defined by the public.

Organized by Issue Category:

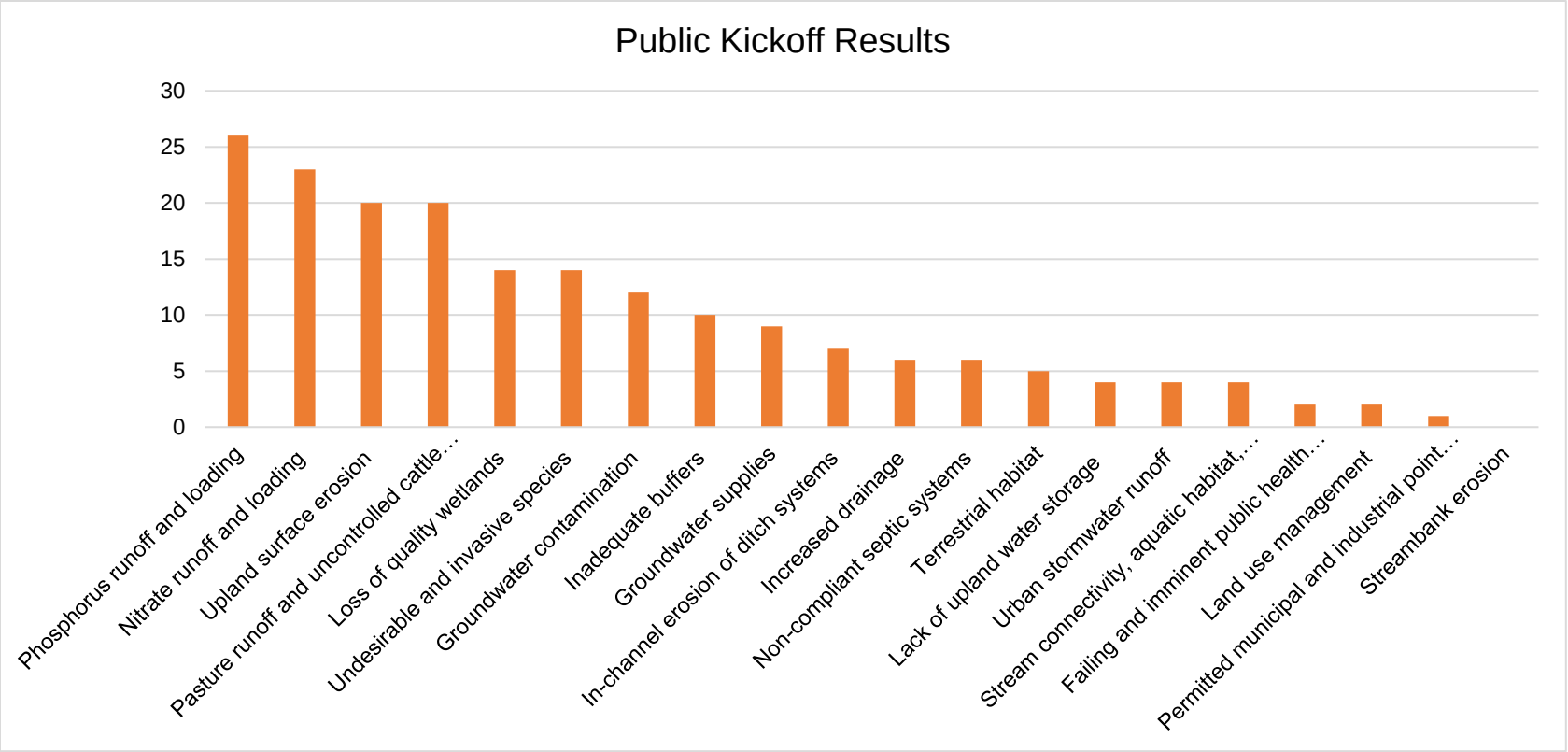
Category	Draft Issue Statement	Votes
Erosion and Sediment	**Upland surface erosion** (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life and recreation.	**20**
	Streambank erosion of sediment and excessive sedimentation in streams stressing aquatic communities.	**0**
	In-channel erosion of ditch systems impacting system capacity, maintenance costs, and sediment loading to receiving surface waters.	**7**
	Inadequate buffers along tributary streams, ditches, and lakes impacting pollutant loading to surface waters.	**10**
Altered Hydrology	**Increased drainage** in agricultural or urban landscapes affecting timing and delivery volume of waters downstream.	**6**
	Lack of upland water storage as a result of historic land use changes leading to altered streamflow patterns and flood frequency, which can be intensified by climatic changes.	**4**
	Loss of quality wetlands which impacts water quality, the ability to store water on the land, and habitat availability.	**14**
Nutrients	**Phosphorus runoff and loading** from agricultural lands to surface waters impacting aquatic life and causing nuisance algal blooms in lakes.	**26**

Category	Draft Issue Statement	Votes
	Permitted municipal and industrial point sources of pollution impacting water quality conditions.	1
	Nitrate runoff and loading from agricultural lands and subsurface tile drainage to surface and groundwater resources impacting aquatic life and drinking water safety.	23
Bacteria	**Failing and imminent public health threat (IPHT) septic systems** impacting drinking water quality.	2
	Pasture runoff and uncontrolled cattle access to streams impacting pollutant loading to surface waters and shoreland erosion.	20
	Urban stormwater runoff and its impact on water quality.	4
Drinking Water	General high risk for **groundwater contamination** due to shallow water tables which endangers drinking water resources.	12
	Need for better protection of groundwater recharge areas to promote and ensure sustainable **supplies of groundwater** resources.	9
Habitat	**Undesirable and invasive species** in surface waters compounding water quality issues.	14
	Poor overall **terrestrial habitat** (including forested areas and areas of perennial ground cover) and lack of habitat connectivity for wildlife leading to poor species richness.	5
	Loss of **stream connectivity, aquatic habitat, and aging infrastructure** impacting aquatic communities.	4
Land Management	**Non-compliant septic systems** leaching nutrients to surface and groundwater impacting overall water quality.	6
	Need for coordinated **land use management** to address development pressure and aggregate mining.	2

In Order of Priority:

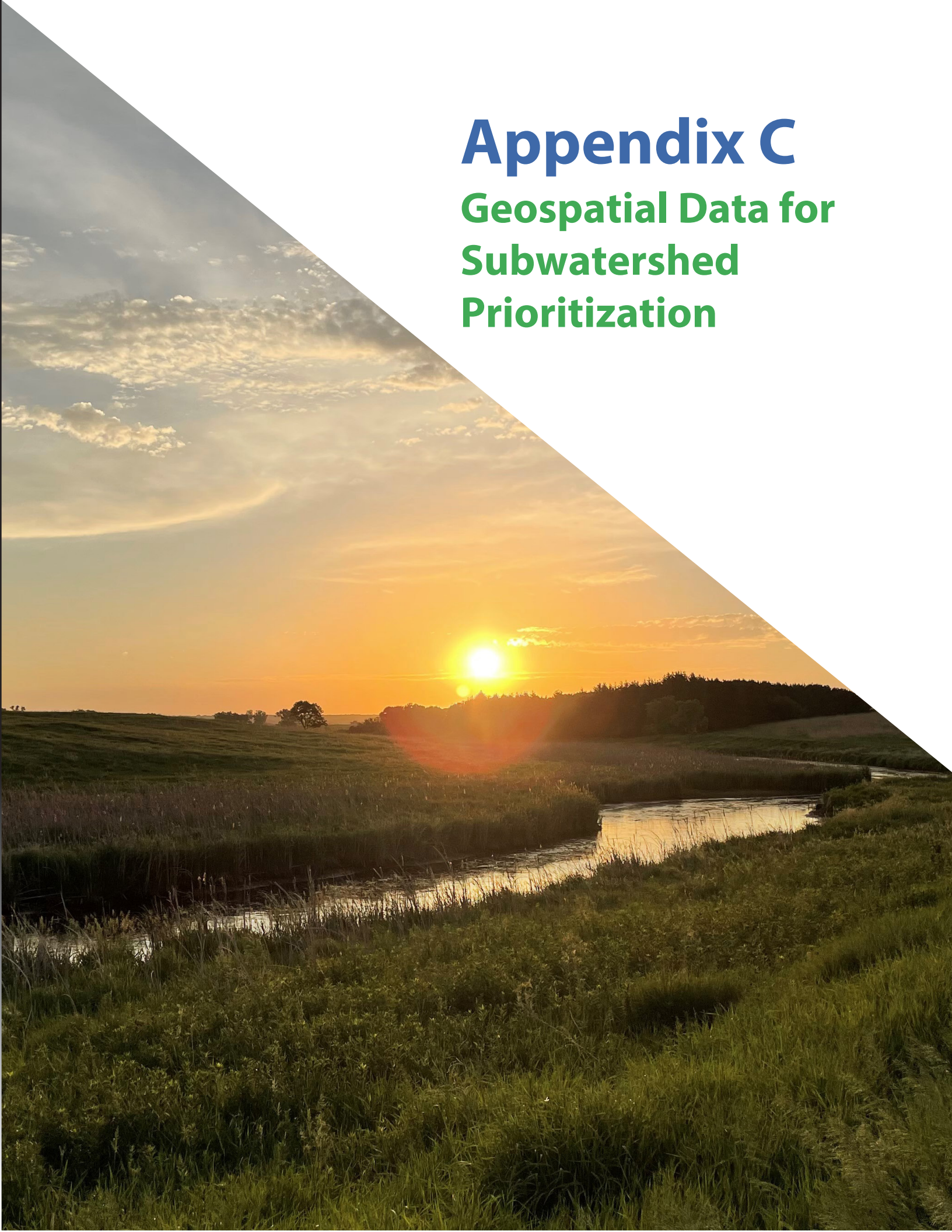
Draft Issue Statement	Votes
Phosphorus runoff and loading from agricultural lands to surface waters impacting aquatic life and causing nuisance algal blooms in lakes.	**26**
Nitrate runoff and loading from agricultural lands and subsurface tile drainage to surface and groundwater resources impacting aquatic life and drinking water safety.	**23**
Upland surface erosion (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life and recreation.	**20**
Pasture runoff and uncontrolled cattle access to streams impacting pollutant loading to surface waters and shoreland erosion.	**20**
Loss of quality wetlands which impacts water quality, the ability to store water on the land, and habitat availability.	**14**
Undesirable and invasive species in surface waters compounding water quality issues.	**14**
General high risk for **groundwater contamination** due to shallow water tables which endangers drinking water resources.	**12**
Inadequate buffers along tributary streams, ditches, and lakes impacting pollutant loading to surface waters.	**10**
Need for better protection of groundwater recharge areas to promote and ensure sustainable **supplies of groundwater** resources.	**9**
In-channel erosion of ditch systems impacting system capacity, maintenance costs, and sediment loading to receiving surface waters.	**7**
Increased drainage in agricultural or urban landscapes affecting timing and delivery volume of waters downstream.	**6**
Non-compliant septic systems leaching nutrients to surface and groundwater impacting overall water quality.	**6**
Poor overall **terrestrial habitat** (including forested areas and areas of perennial ground cover) and lack of habitat connectivity for wildlife leading to poor species richness.	**5**
Lack of upland water storage as a result of historic land use changes leading to altered streamflow patterns and flood frequency, which can be intensified by climatic changes.	**4**
Urban stormwater runoff and its impact on water quality.	**4**

Draft Issue Statement	Votes
Loss of **stream connectivity, aquatic habitat, and aging infrastructure** impacting aquatic communities.	**4**
Failing and imminent public health threat (IPHT) septic systems impacting drinking water quality.	**2**
Need for coordinated **land use management** to address development pressure and aggregate mining.	**2**
Permitted municipal and industrial point sources of pollution impacting water quality conditions.	**1**
Streambank erosion of sediment and excessive sedimentation in streams stressing aquatic communities.	**0**



Appendix C

Geospatial Data for Subwatershed Prioritization



Chippewa River Comprehensive Watershed Management Plan

Geospatial Data for Subwatershed Prioritization

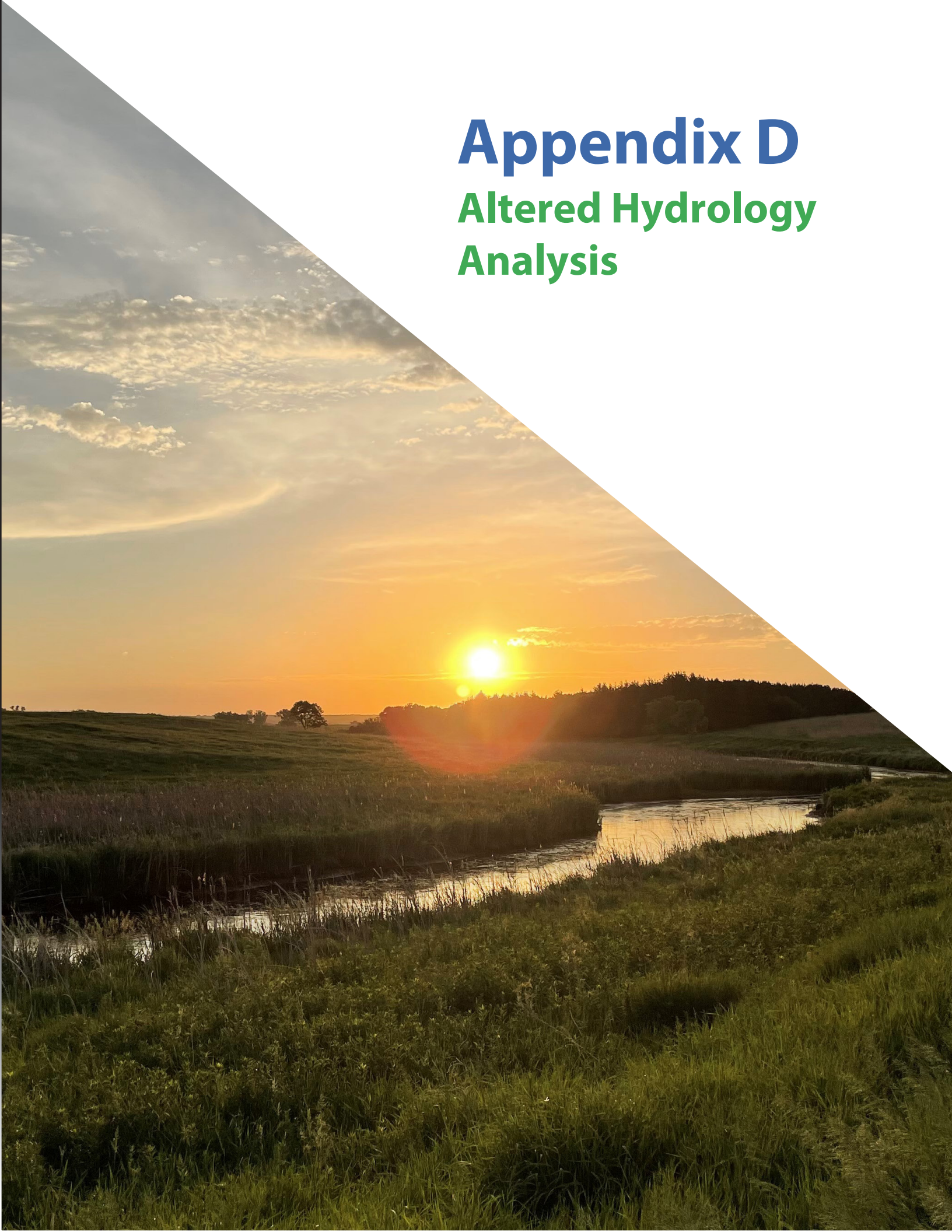
Issue Statement		Plan Priority	Geospatial Data
Erosion and Sediment	**Upland surface erosion** (inclusive of ravine, gully, and wind erosion) causing detachment and transport of valuable soils and sediment to surface water, impacting aquatic life and recreation.	**High**	• PTMApp HUC 12 sediment yields
	Erosion and sloughing of streams and ditches increases sediment and nutrient loading to surface water impacting aquatic communities and overall channel structure.	**Medium**	• HSPF HUC 12 band and channel yield
Hydrology	The combination of **expanding drainage, lack of upland water storage, changes to land use patterns, and increased precipitation** have resulted in increased discharge and frequency across the entire range of flows in the Chippewa River Watershed. These effects have impacts on water quality, aquatic life, and downstream flooding.	**High**	• Altered streams (https://gisdata.mn.gov/dataset/water-altered-watercourse) • MPCA Impaired stream AQL-altered hydrology stressor • DNR WHAF - Hyd Metric - Hydro Storage - Straightened-Meandering Streams (https://gisdata.mn.gov/dataset/env-watershed-health-assessment) • Restorable wetlands HUC 12
	Loss of quality wetlands which impacts water quality, the ability to store water on the land, and habitat availability.	**High**	
Nutrients	**Nutrient (phosphorus and nitrate) and pesticide runoff and loading** to surface waters impacting aquatic life and recreation.	**High**	• PTMApp HUC 12 total phosphorus yields • PTMApp HUC 12 total nitrogen yields

Issue Statement		Plan Priority	Geospatial Data
	Noncompliant septic systems that discharge to the surface or that are not designed properly to protect groundwater and surface water resources.	**Medium**	• Presence of priority lakes
	Feedlots, pasture runoff, uncontrolled cattle access to streams, and manure management impacting pollutant loading to surface waters.	**Medium**	
	Urban stormwater runoff and its impact on water quality.	**Medium**	
Groundwater	General high risk for **groundwater contamination** from nutrients, pesticides, and unsealed wells due to shallow water tables which endangers drinking water resources.	**Medium**	• DWSMA (https://gisdata.mn.gov/dataset/water-drinking-water-supply) • Pollution sensitivity of near surface materials (https://gisdata.mn.gov/dataset/water-altered-watercourse) • Bonanza Valley Groundwater Management Area • MDH Nitrate well data • DNR WHAF - water withdrawal vulnerability (https://gisdata.mn.gov/dataset/env-watershed-health-assessment)
	Need for **wise use of groundwater** resources to promote and ensure sustainability of **supplies**	**Medium**	
Habitat	Need for protection and improvement of existing terrestrial habitat (including **forested areas, prairie,** and areas of **perennial ground cover**) and habitat connectivity to promote wildlife and species richness.	**High**	• Existing retirement programs and easements (USFW, WPAs, WMAs, RIM, CREP) • MN DNR Prairie conservation plan - cores, corridors, and strategic complexes

Issue Statement		Plan Priority	Geospatial Data
	Loss of **stream connectivity, aquatic habitat, and aging infrastructure** impacting aquatic communities.	**Medium**	• DNR WHAF - Con Index - Aquatic Disruption (https://gisdata.mn.gov/dataset/env-watershed-health-assessment) • DNR WHAF - Con Index - Riparian Connectivity (https://gisdata.mn.gov/dataset/env-watershed-health-assessment) • DNR Dam layer • MPCA Impaired stream AQL-Lack of connectivity
	Need for protection and improvement of **shoreland habitat**.	**High**	• NHDWaterbodies (Developed land within a 1000ft buffer around lakes) • Miles of priority lake shoreland per HUC 12 area
Land Management	Decreased **soil health** and its impact on agricultural productivity, water quality, and water holding capacity.	**High**	• PTMApp: Top 10% of sediment area per HUC 12 • PTMApp: Top 10% of total phosphorus area per HUC 12

Appendix D

Altered Hydrology Analysis



Technical Memorandum

To: Holly Kovarik, Pope SWCD
Chippewa River Watershed Association

From: Timothy Erickson PE
Houston Engineering, Inc.

Subject: Chippewa River Altered Hydrology Analysis

Date: February 14, 2022

Project: 10887-0001

1.0 INTRODUCTION

One of the stressors commonly referenced as a reason for aquatic life impairments is “altered hydrology.” Altered hydrology is commonly thought to be characterized by increases in peak discharge and runoff volume for a range of precipitation events, as compared to some historic or benchmark condition. Numerous studies have suggested that this hydrologic alteration is a result of some combination of climatic variation, land use/land cover changes, or other landscape scale changes. Aquatic habitat loss, increased streambank erosion and bank failure, and increased sediment levels are some of the suggested consequences of altered hydrology. Individually and collectively these are believed to lead to the impairment of aquatic life, exhibited by lower ecological diversity.

This technical memorandum (TM) describes a framework used define and quantify altered hydrology using records for the USGS’s long-term, continuous flow gaging network. In addition, this TM describes methods to estimate storage goals based on changes of altered hydrology metrics that can be used to develop management plans to help mitigate the impacts of alteration.

1.1 A NEED TO ASSESS ALTERED HYDROLOGY

Although a general sense of the characteristics of altered hydrology exists, a substantive challenge remains. A challenge associated with addressing altered hydrology is the lack of a common definition, including agreement on a set of science-based metrics to establish the desired (i.e., benchmark) condition, and assess whether altered hydrology has indeed occurred. **Figure 1** provides an example of hydrologic data which could be used to illustrate altered hydrology. **Figure 1** shows a flow duration curve for a streamflow gage in the Sand Hill River Watershed, within northwestern Minnesota. Two 30-year time periods are shown on the graph; i.e., 1980 – 2010 (solid line) and 1945 - 1975 (dashed line). The graph represents the likelihood of exceeding a specific daily mean discharge. The graph indicates an increase in the daily mean discharge through most of the flow range, because for the same likelihood of exceedance the daily mean discharge is greater for the more recent time periods. This suggests "altered hydrology" meaning that flow conditions in the watershed differ between the two time periods. The example illustrates one possible visual metric which could be used to describe altered hydrology.

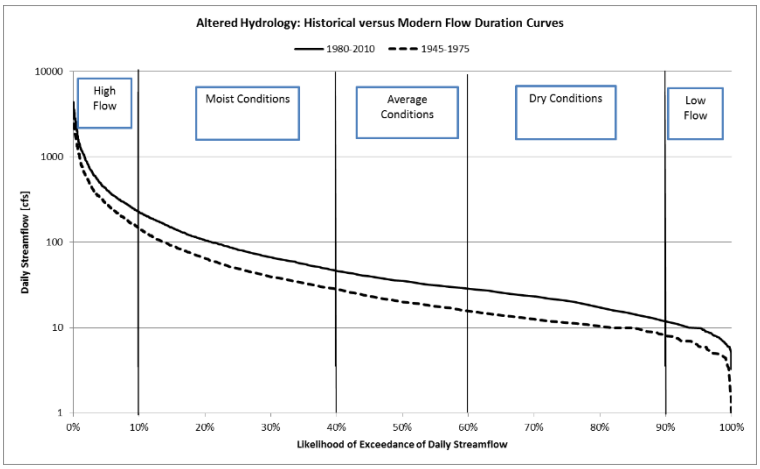


Figure 1. Flow duration curve for the Sand Hill River at Climax, Minnesota. The solid black line shows an increase in daily mean discharge for the 1980 – 2010 period, compared to the early 1945 – 1975 period.

Agreement on a set of science-based metrics to assess the extent of hydrologic alteration and the desired (i.e., benchmark) condition is needed in order to quantitatively assess changes in the hydrology of a watershed. A definition is needed to rigorously assess whether hydrology has indeed changed through time, establish goals for altered hydrology, and assess and evaluate various means, methods and projects to mitigate the adverse effects of altered hydrology.

Considerable research and technical information relative to describing altered hydrology has been completed. The recent released report titled "Technical Report: Protection Aquatic Life from Hydrologic Alternatives" (Novak et al., 2015) is one example. The report presents metrics which can be used to describe altered hydrology. However, causal information about how the change in hydrology results in the alteration or loss of ecological function is lacking within the report.

For the hydrology of a watershed to be altered there must be some deviation from a preferred or desired hydrologic condition; i.e., a "benchmark" condition. The benchmark for altered hydrology could be the "natural hydrologic regime" or some other condition. The natural hydrologic regime (Poff et al 1997; Arthington et al 2006; Bunn and Arthington 2002 ; Sparks 1995) is the characteristic pattern of water quantity, timing and variability in a natural water body. A river's hydrologic or flow regime consists of environmental flow components (Mathews and Richter, 2007; The Nature Conservancy, 2009), each of which can be described in terms of the magnitude, frequency, duration, timing and rate of change in discharge. The integrity of an aquatic system presumably depends on the natural dynamic character of these flow components to thereby driving ecological processes.

Defining altered hydrology and the benchmark condition, identifying the metrics to describe altered hydrology and translating the information into goals to mitigate the adverse consequences is technically challenging. The approach used to evaluate whether a watershed exhibits altered hydrology is presented within this document. A definition of altered hydrology is presented. Specific quantitative metrics to assess the extent of hydrologic change and the desired (i.e., benchmark) condition are also presented. No effort is made to describe the causal relationship between hydrology and the ecological, geomorphological or water quality effects. Rather, the assumption is made that the desired condition is achieved by obtaining the benchmark condition. These results are intended to be a beginning point in addressing the topic of altered hydrology in a more rigorous manner, which no doubt will evolve through time.

2.0 A METHODOLOGY TO DEFINE ALTERED HYDROLOGY

2.1 A BRIEF HISTORY OF CHANGING HYDROLOGY

Streamflow in Minnesota (Novotny & Stefan, 2007) and across the contentious United States (Lins and Slack 1999, McCabe and Wolock, 2002) have been changing during the past century, with flows in the period starting from the 1970s to the beginning of the 21st Century tending to be higher than during the early to mid-1900s (Ryberg et al. 2014). Numerous studies have been conducted to quantify magnitude of impact and pinpoint relative importance of potential causes of these changes, but scientific consensus has currently not been achieved. The science is not at a point where specific causes can be attributed to altered hydrology with any significant certainty and public discussion about specific causes usually leads to barriers to implementation. In general, the leading candidate causes of altered hydrology can be categorized into to two primary groups: climatic changes and landscape changes. Examples of climatic changes include changes in annual precipitation volumes, in surface air temperature, timing of the spring snowmelt, annual distribution of precipitation, and rainfall characteristics (timing, duration, and intensity). Examples of landscape changes include changes in land use/land cover, increased imperviousness (urbanization), tile drainage and drainage ditching, wetland removal/restoration, groundwater pumpage, flow retention and regulation, and increased storage (both in-channel and upland storage). Although it is important to water resource management to understand the mechanics behind the changes in hydrology, the focus of this analysis is developing a definition for altered hydrology, a method for assessing whether it has occurred within a watershed, and establishing a goal for addressing altered hydrology. No assumption of causation is made or needed to use this framework.

2.2 ALTERED HYDROLOGY DEFINED

Altered hydrology is defined as a *discernable* change in specific metrics derived from stream discharge, occurring through an entire annual hydrologic cycle, which exceed the measurement error, compared to a benchmark condition. For this framework, *discernable* has been used as a proxy for statistical comparisons. The metrics are typically some type of hydrologic statistic derived from the annual discharge record across a long period of time, usually a minimum of 20-years (Gan et al. 1991). The amount of baseflow, the hydrograph shape, peak discharge, and runoff volume for a range of precipitation event magnitudes, intensities, and durations are specific components of or derived from the annual hydrograph.

2.3 ESTABLISHING BENCHMARK CONDITION

A reference or "benchmark" condition is needed to complete an assessment of whether hydrology is altered. A minimum of a 20-year time-periods reasonably ensures stable estimates of streamflow predictably (Gan et al. 1991; Olden & Poff 2003), sufficient duration to capture climate variability and the interdecadal oscillation typically found in climate (McCabe et al. 2004, Novotny and Stefan 2007), and is the standard timespan used for establishing "normal" climate statistics in the United States. Where the extent data allows it, the analysis is performed for two 35-year time periods; i.e., a benchmark period called "historic" and an "altered" state or called "modern"). The benchmark period used to establish benchmark conditions represents the period before shifts in hydrology are commonly thought to have begun within Minnesota as a result of land use/land cover changes, or increases in the depth, intensity, and duration of precipitation.

To illustrate an example of a change in streamflow and the validity in the breakpoint period, cumulative streamflow (using annual depth values) is plotted across time (**Figure 2)** for the USGS gage at Crow River at Rockford, MN (USGS ID: 05280000). Cumulative streamflow was used instead of straight annual streamflow because (1) it linearizes streamflow relationship where the slope of a trendline would be the average annual streamflow, (2) no assumptions about multi-year dependencies (e.g. changes in storage) or autocorrelation is necessary, and (3) changes in slope can be visualized, showing an altered state of hydrology.

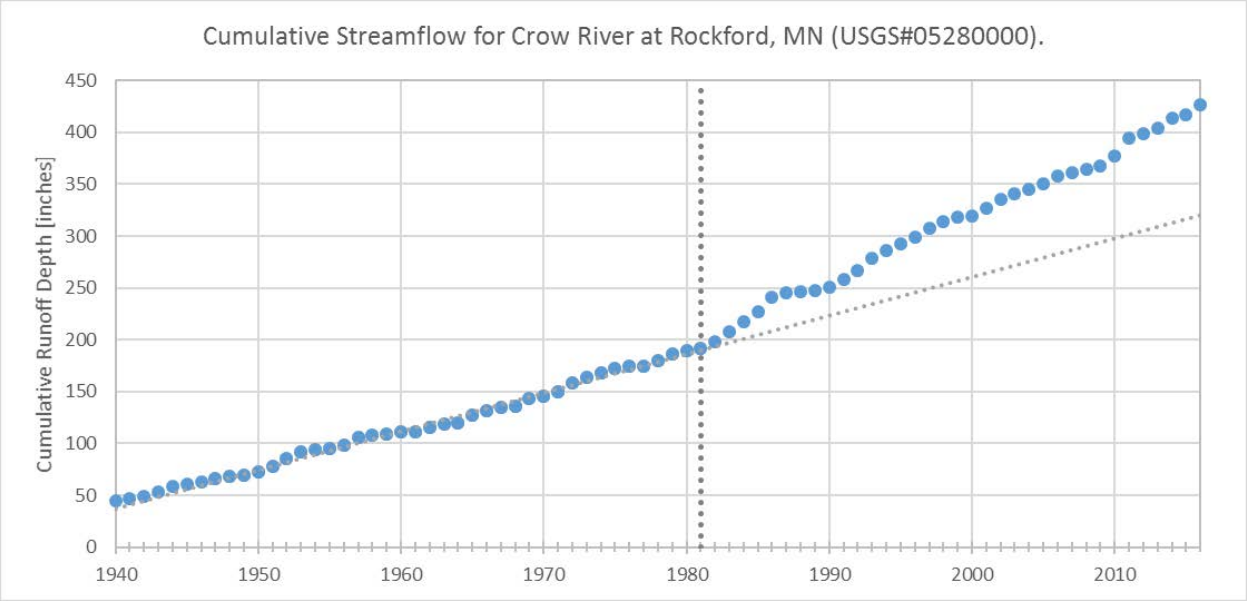


Figure 2. Cumulative streamflow for the Crow River at Rockford, MN (USGS Station 05280000).

Results from analysis shown in the example (**Figure 2**) determine the break point and define the benchmark and modern conditions.

2.4 METRICS USED TO ASSESS ALTERED HYDROLOGY

Many potential metrics can be used to describe a measurable change in the annual hydrograph. For example, the indicators of hydrologic alteration software developed by the Nature Conservancy

(https://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Pages/indicators-hydrologic-alt.aspx) uses 67 different statistics derived from mean daily discharge to describe altered hydrology. Ideally, each indicator or metric could be causally linked to an ecological or geomorphological consequence, although this is technically challenging. Use of such a large number of indictors can be problematic as many of the metrics can be correlated and are therefore interdependent or lack ecological or geomorphological meaning.

The structure and therefore function of ecological systems are often "driven" by "non-normal" events; e.g., low flows associated with drought, higher flows which inundate the floodplain. Metrics used to complete this analysis were preferentially selected to reflect the variability in specific characteristics of the annual hydrograph, and include peak discharges, runoff volumes and hydrograph shape. Each metric was specifically selected to represent a flow condition believed to be of ecological or geomorphological importance, in the absence of causal information. **Table 1** shows the specific metrics used to complete the analysis. The use of these metrics is intended to identify: 1) whether the hydrology within a watershed is indeed altered: and 2) which resources may be at risk because of the alteration.

Table 1. Metrics used to define and assess whether hydrology is "altered" for a specific watershed.

Relevance	Hydrograph Feature	Frequency of Occurrence	Duration	Metric	Ecological or Geomorphic Endpoint
Condition of Aquatic Habitat	Baseflow	10-year	30 day	The minimum change between time periods is the accuracy of measuring streamflow discharge and estimating daily mean discharge. A discharge measurement accurate within 10% of the true value is considered excellent by the United States Geological Survey (USGS). Some additional error is induced through the conversion of these data to discharge. Therefore, a minimum change of 15% is needed between "historic" and "modern" period for this metric to classified as "altered."	Discharge needed to maintain winter flow for fish and aquatic life.
		Annual	30-day median (November)		
Aquatic Organism Life Cycle	Shape	Mean	Monthly average of daily means	Use the "historic" period of record to define "normal variability." Develop a histograms of daily mean discharges for each month within the period of record for the "historic" and "modern" time periods. Compare the histograms of the monthly average of daily means using an appropriate statistical test. Assume the histograms are from the same statistical population and text for significance at an appropriate significance level.	Shape of the annual hydrograph and timing of discharges associated with ecological cues.
	Timing	Julian day of minimum	1-day		
		Julian day of maximum			
Riparian Floodplain (Lateral) Connectivity	Peak discharge	10-year	24-hour and 10-day	The minimum change between time periods is the accuracy of measuring streamflow discharge and estimating daily mean discharge. A discharge measurement accurate within 10% of the true value is considered excellent by the United States Geological Survey (USGS). Some additional error is induced through the conversion of these data to discharge. Therefore, a minimum change of 15% is needed between "historic" period and "modern" period for this metric to classified as "altered."	Represents the frequency and duration of flooding of the riparian area and the lateral connectivity between the stream and the riparian area. Functions include energy flow, deposition of sediment, channel formation and surface water – groundwater interactions
		50-year			
		100-year			
	Volume	10-year	Total runoff volume for those days with a daily mean discharge exceeding the 24-hour discharge		
		50-year			
		100-year			
Geomorphic Stability and Capacity to Transport Sediment	Peak Discharge	1.5 year	24 - hour	The minimum change between time periods is the accuracy of measuring streamflow discharge and estimating daily mean discharge. A discharge measurement accurate within 10% of the true value is considered excellent by the United States Geological Survey (USGS). Some additional error is induced through the conversion of these data to discharge. Therefore, a minimum change of 15% is needed between "historic" period and "modern" period for this metric to classified as "altered."	Channel forming discharge. An increase is interpreted as an increased risk of stream channel susceptibility to erosion.
	Volume	1.5 year	Cumulative daily volume exceeding channel forming discharge		
		Average daily	30-year flow duration curve		

2.5 DETERMINATION OF ALTERED HYDROLOGY

A simple weight of evidence approach is used to decide whether the hydrology of a watershed is “altered” between two time periods. A “+” is assigned to each metric if it has a discernable increase from the benchmark as defined by the metric, between the historic and modern time periods. A “-“ is assigned to each metric if it has a discernable decrease from the benchmark as defined by the metric, between the historic and modern time periods. An “o” is assigned to each metric if it lacks a discernable increase or decrease from the benchmark as defined by the metric, between the historic and modern time periods. If the number of “+” values exceeds the number of “-“ values, an increase in the watershed response to precipitation is implied and the hydrology is considered altered between the two time periods. If the number of “-” values exceeds the number of “+“ values, the a decrease in the watershed response to precipitation is implied and the hydrology is considered altered between the two time periods. The hydrologic response of the watershed is considered “altered” if the percentage of + and – signs exceeds 50% in any group of metrics.

2.6 ESTABLISHING ALTERED HYDROLOGY GOALS

There are two types of goals; i.e., a qualitative and a quantitative goal. The qualitative goal is to return the hydrology to the benchmark condition. The qualitative goal is evaluated using a weight of evidence approach. The goal is simply to achieve the conditions for the historic period as defined by the metrics with **Table 1**. It is presumed the historic period is “better” from an ecological and geomorphological perspective.

The second type of goal is a quantitative storage goal. Several of the metrics within **Table 1** can be used to establish storage goals, which may be accomplished by a variety of types of projects. These project types include not only traditional storage but increasing the organic matter content of soils. These goals are the change in volume between the historic and modern time periods. The volume needs to be described by the effective volume, which is the amount of storage required on the landscape.

2.7 METHODS FOR EVALUATING ALTERED HYDROLOGY MITIGATION STRATEGIES

Several methods can be used to develop strategies to mitigate the effects of altered hydrology. These methods include the use of continuous simulation hydrology models (like the Hydrologic Simulation Program Fortran) and the event-based hydrology approaches (like those within the Prioritize, Target and Measure Application).

3.0 ALTERED HYDOLOGY IN THE CHIPPEWA RIVER

The following are summaries of results from the altered hydrology analysis conducted on long-term gaging stations.

3.1 CHIPPEWA RIVER NEAR MILAN, MN (USGS# 05304500)

The USGS long-term, continuous flow gaging station in the Chippewa River near Milan, MN (USGS# 05304500) and drains approximately 1,250 square miles. The data record starts in 1937 runs through 2023 (present day). The flow record was downloaded on February 10, 2023. The site includes both daily average streamflow records and peak flow measurements. **Figure 3** shows the cumulative streamflow (in inches per year) for the gaging site. Cumulative streamflow is used to determine a breakpoint between the benchmark condition and the altered condition (see **Section 2.3**).

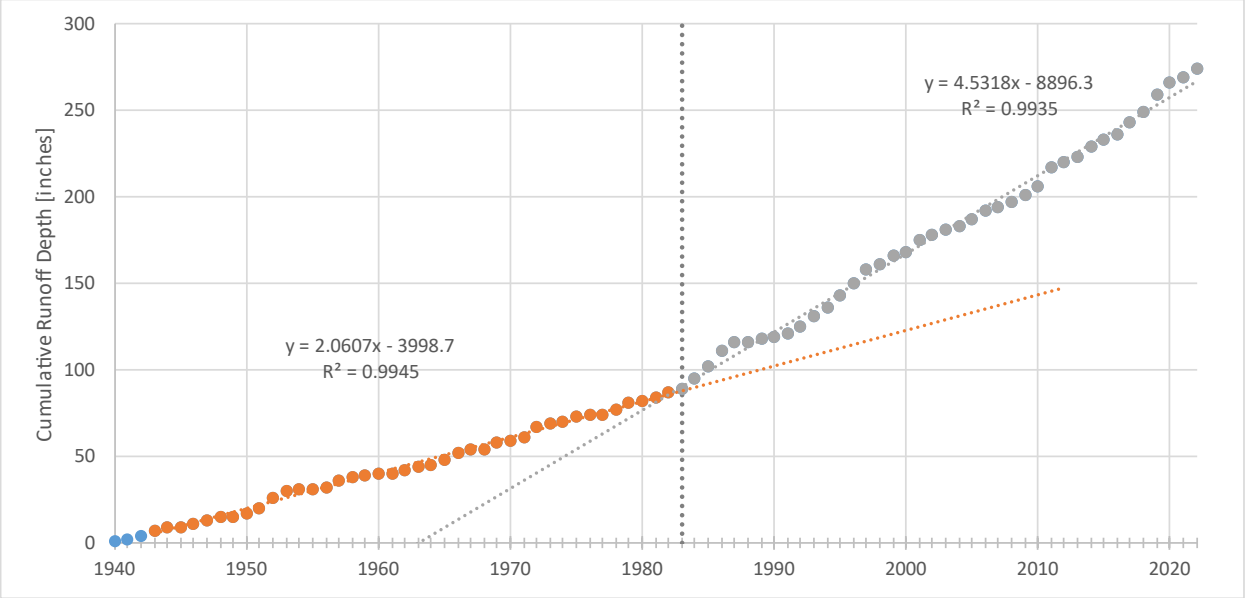


Figure 3. Cumulative streamflow for Chippewa River near Milan, MN (USGS# 05304500).

According to the cumulative streamflow analysis, a breakpoint exists around 1983. Therefore, the benchmark ("historic") conditions will include data from 1943-1982 and the altered ("modern") will include data form 1983-2022.

A summary of the results from the altered hydrology analysis is provided in **Table 2.** A more detailed description of the results is provided in **Appendix A**. A summary of the storage goals based on the altered hydrology analysis are provided in **Section 4**.

Table 2: Altered Hydrology Summary for Chippewa River near Milan, MN (USGS# 05304500).

Group	Metric	% Difference	Altered Hydrology Metric	Evidence of Altered Hydrology for Group
Aquatic Habitat	10-year, Annual Minimum 30-day Mean Daily Discharge	725%	+	Yes, Increasing
	10-year, Annual Minimum 7-day Mean Daily Discharge	694%	+	
	Median November (Winter Base) Flow	323%	+	
Aquatic Organism Life Cycle	Magnitude of Monthly Runoff Volumes	53.8%-to-485%	+	Yes, Increasing
	Distribution of Monthly Runoff Volumes	-32.1%-to-158%	o	
	Timing of Annual Peak Discharge	26.3%	+	
	Timing of Annual Minimum Discharge	59.8%	+	
Riparian Floodplain (Lateral) Connectivity	10-year Peak Discharge Rate	55.3%	+	Yes, Increasing
	50-year Peak Discharge Rate	30.8%	+	
	100-year Peak Discharge Rate	22.0%	+	
	Average Cumulative Volume above the Historic 10-year Peak Discharge	59.7%	+	
	Average Cumulative Volume above the Historic 50-year Peak Discharge	751%	+	
	Average Cumulative Volume above the Historic 100-year Peak Discharge	NA	NA	
Geomorphic Stability and Capacity to Transport Sediment	1.5-year Peak Discharge Rate	96.6%	+	Yes, Increasing
	2-year Peak Discharge Rate	89.0%	+	
	Average Cumulative Volume above the Historic 1.5-year Peak Discharge	134%	+	
	Average Cumulative Volume above the Historic 2-year Peak Discharge	124%	+	
	Duration above the Historic 1.5-year Peak Discharge	110%	+	
	Duration above the Historic 2-year Peak Discharge	104%	+	
	Flow Duration Curve	43.9%-to-452%	+	

4.0 STORAGE GOALS

Goals for addressing the change in hydrology were estimated using four methods. Each method is based on different assumptions and altered the metrics for a specific "altered hydrology" group. The first method is focused on the aquatic habitat and geomorphic and ability to transport sediment metric group and uses the change in the cumulative volume for mean daily discharges, exceeding the 1.5-year return period event. The cumulative total volume when the daily average discharge exceeds the 1.5-year peak discharge includes all flows above the 1.5-year peak, i.e. can include storms with much larger return periods. This method is based on the changes in the observed data and since it includes all flows above the 1.5-year flow relies on the two periods to have a similar distribution of flows. The second method is based on the changes in hydrology across the entire annual hydrograph and integrates the differences in return period discharges between the modern and historic period and finding a probability-weighted representative change in flow rate. A volume is found by assuming a flow period equal to the change in flow period for the 1.5-year flow (i.e. the change in the number of days above the 1.5-year flow). This method assumes a constant flow over a representative duration to estimate the storage goal. Since a hydrograph typically changes over time, this method may over-estimate the storage goal. The third method is also based on addressing the effects through the entire flow range and is a revision to Method 2. Method 3 considers incorporates the observed change in the timing of the peak discharge for each return period event. This method uses the probability-weighted representative change in flow rate and multiples the flow rates by the change in the number of days exceeding the return period flow for each return period. Method 4 estimates a storage goal based on changes in the flow duration curve (FDC) (see **Figure A.6**). Method 4 integrates the changes in the FDC between two periods and applies the probability of each flow to occur. In statistics, this method would be referred to as the expected number of FDC.

This analysis presents a preliminary framework for defining altered hydrology, applying a method to determine whether altered hydrology has occurred, and establishing a goal for relating to proposed projects. The storage goals are provided in **Table** 3 for each of the four methods. For planning purposes, we recommend a preliminary goal equal to a representative goal, taken as the average of the 4 methods, across the watershed, realizing that the altered hydrology goals should ideally be established at the 12-digit HUC scale. However, method 2 provides a storage goal nearly double the other three methods and will not be included in the representative storage goal. The average, representative storage goal is **0.71 inches** across the watershed, or **71,618 acre-feet**. The actual amount of mitigation needed may exceeds the estimated range, as the methods used to achieve the goal are not expected to be 100% effective in removing volume from peak of the hydrograph. The means to achieve the estimated mitigation goal may include the use of structural practices and management practices and should be specifically evaluated through completion of a hydrologic study or the use of appropriate tools and models.

Table 7: Storage goals for rivers in the Chippewa River.

Stream	USGS ID	Storage Targets			
		Method 1	Method 2	Method 3	Method 4
Chippewa River near Milan, MN	05304500	0.62 in.	1.50 in.	0.79 in.	0.73 in.

Details on calculations of the storage goals can be found in the Appendices.

.

REFERENCES

Arthington, A.H., Bunn, S.E., Poff, N.L., and Naiman, R.J., 2006, The challenge of providing environmental flow rules to sustain river ecosystems: Ecological Applications, v. 16, p. 1,311–1,318. [Also available at http://dx.doi.org/10.1890/1051-0761(2006)016[1311:TCOPEF]2.0.CO;2]

Bunn, S.E., and Arthington, A.H., 2002, Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity: Environmental Management, v. 30, no. 4, p. 492–507. [Also available at http://dx.doi.org/10.1007/s00267-002-2737-0.]

Gan K.G., T.A. McMahon, and B.L. Finlayson. (1991). Analysis of periodicity in streamflow and rainfall data by Colwell's indices. *Journal of Hydrology* 123: 105–118.

Lins, H. F., and J. R. Slack (1999), Streamflow trends in the United States, Geophysical Research Letters. 26(2): 227–230

Mathews R. & Richter B. (2007) Application of the Indicators of Hydrologic Alteration software in environmental flow-setting. Journal of the American Water Resources Association, 43, 1–14.

McCabe, G.J., Palecki, M.A., and Betancourt, J.L. 2004. Pacific and Atlantic Ocean Influences on Multidecadal Drought Frequency in the United States. Proceedings of the National Academy of Sciences. V. 101, no. 12 4136-4141.

Novak, Rachael, Kennen, J.G., Abele, R.W., Baschon, C.F., Carlisle, D.M., Dlugolecki, Laura, Flotermersch, J.E., Ford, Peter, Fowler, Jamie, Galer, Rose, Gordon, L.P., Hansen, S.N., Herbold, Bruce, Johnson, T.E., Johnston, J.M., Konrad, C.P., Leamond, Beth, and Seelbach, P.W, 2015, Draft: EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration: U.S. Geological Survey Scientific Investigations Report 2015–5160, U.S. Environmental Protection Agency EPA Report 822-P-15-002, 163 pp., http://pubs.usgs.gov/sir/2015/5160/ and http://www2.epa.gov/wqc/aquatic life-ambient-water quality-criteria

Novotny, E.V. and Stefan, H.G. 2007. Streamflow in Minnestoa: indicator of Climate Change. Journal of Hydrology 334, 319-333.

Olden J.D. and N.L. Poff. (2003). Redundancy and the choice of hydrologic indices for characterizing streamflow regimes. *River Research and Applications* 19: 101-121.

Poff, N.L., Allan, J.D., Bain, M.B., Karr, J.R., Prestegaard, K.L., Richter, B.D., Sparks, R.E., and Stromberg, J.C., 1997, The natural flow regime—A paradigm for river conservation and restoration: Bioscience, v. 47, no. 11, p. 769–784. [Also available at http://www.americanrivers.org/assets/pdfs/water-supply/the-natural-flow-regime.pdf?bf5c96.]

Ryberg, K. R., W. Lin, and A. V. Vecchia (2014), Impact of climate variability on runoff in the North-Central United States, *Journal of Hydrologic Engineering* 19:148–158, doi:10.1061/(ASCE)HE.1943-5584.0000775.

Sparks, Richard E., 1995 Need for Ecosystem Management of Large Rivers and Their Floodplains-These phenomenally productive ecosystems produce fish and wildlife and preserve species. Bioscience, v. 45, no. 3, p. 168–182.

APPENDIX A: METRICS OF ALTERED HYDROLOGY FOR THE CHIPPEWA RIVER NEAR MILAN, MN (USGS# 05304500).

The following is the summary statistics used to determine the altered hydrology metrics in detail and develop the storage goals. A summary of these statistic is shown in **Table 2** in **Section 3**.

A.1 CONDITION OF AQUATIC HABITAT

The condition of aquatic habitat includes a group of metrics that primarily reflect the flow characteristics of the annual hydrograph, needed to maintain adequate habitat for fish and aquatic life. The 7-day low flow, the 30-day low flow, and the median November mean daily discharge are metrics used to represent changes in the availability of flow for aquatic habitat.

A.1.1 Annual minimum 30-day mean daily discharge

The annual minimum 30-day mean daily discharge is the minimum of the 30-day moving mean daily discharge within a year (an annual minimum series). **Figure A.1** shows the annual minimum 30-day mean daily discharge for select return periods (1.01-year, 1.5-year, 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year). **Table A.1** summarizes the data shown in **Figure A.1**.

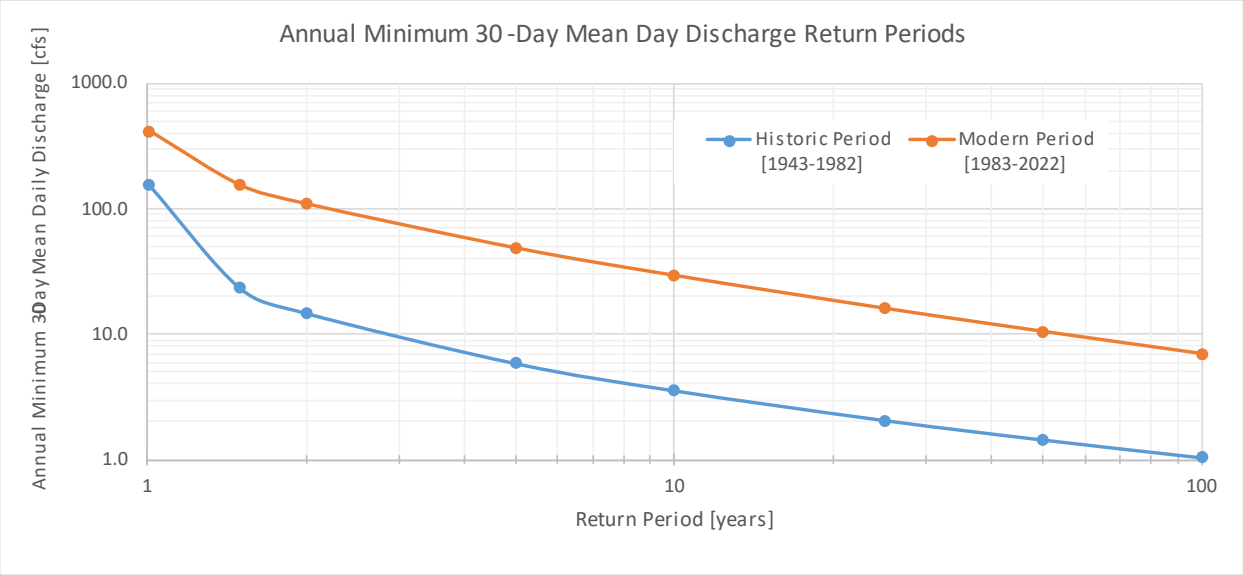


Figure A.1. Historical versus modern annual minimum 30-day mean daily discharge versus return period for Chippewa River near Milan, MN (USGS# 05304500).

Table A.1: Summary of annual minimum 30-day mean daily discharge by return periods for the Chippewa River near Milan, MN (USGS# 05304500).

Return Period	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.	Altered Hydrology Criterion
1.01	155.8	417.3	167.9%	+
1.5	23.4	154.3	559.5%	+
2	14.8	109.6	640.8%	+
5	5.9	48.6	729.5%	+
10	3.6	29.3	725.2%	+
25	2.1	16.0	679.2%	+
50	1.4	10.5	629.2%	+
100	1.0	7.0	573.2%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

A.1.2 Annual Minimum 7-Day Mean Daily Discharge

Like the annual minimum 30-day mean daily discharge, the annual minimum 7-day mean daily discharge is the minimum of the 7-day moving average flow in the year. **Figure A.2** shows the annual minimum 7-day mean daily discharges for select return periods (1.01-year, 1.5-year, 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year). **Table A.2** summarizes the data shown in **Figure A.2**.

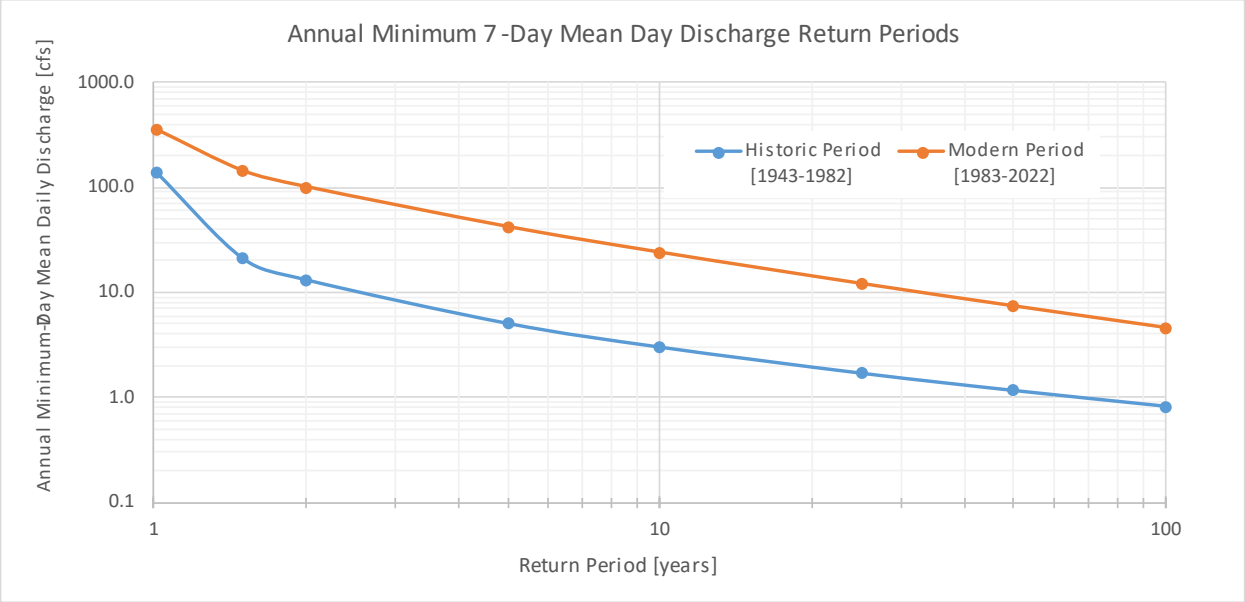


Figure A.2. Historical versus modern annual minimum 7-day mean daily discharge return periods for Chippewa River near Milan, MN (USGS# 05304500).

Table A.2: Summary of annual minimum 7-day mean daily discharge return periods for the Chippewa River near Milan, MN (USGS# 05304500).

Return Period	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.	Altered Hydrology Criterion
1.0101	139.1	353.6	154.2%	+
1.5	20.9	142.4	582.4%	+
2	13.1	100.3	666.5%	+
5	5.0	41.8	729.6%	+
10	3.0	23.8	694.1%	+
25	1.7	12.0	607.6%	+
50	1.2	7.3	531.5%	+
100	0.8	4.6	454.8%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

A.1.3 November Median Daily Discharge

The median daily mean discharge for November is another indicator of baseflow. This metric is intended to represent baseflow condition during the winter months. **Table A.3** provides the median November flow for each period.

Table A.3: Historical and modern median November flow for the Chippewa River near Milan, MN (USGS# 05304500).

Return Period	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.	Altered Hydrology Criterion
Period median November flow [cfs]	77.0	326.0	323.4%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

A.2 AQUATIC ORGANISM LIFE CYCLE

The shape of the annual hydrograph and timing of discharges are associated with ecological cues. Metrics related to the aquatic organism life cycle include the shape of the annual hydrographs, timing of the annual minimum flow, and timing of the annual peak flow.

A.2.1 Annual Distribution of Discharges

The annual distribution of runoff is shown two ways: as average monthly runoff volume in acre-feet per month (**Figure A.3**) and as a percentage of average annual runoff volume (**Figure A.4**). **Table A.4** summarized the data used to generate **Figures A.3** and **A.4**.

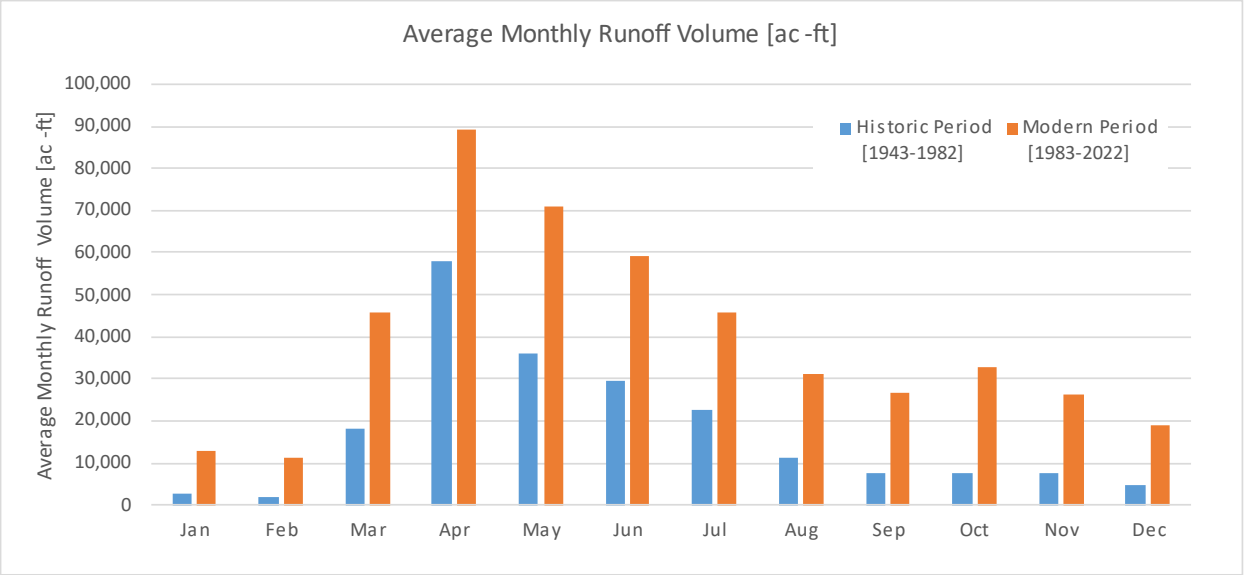


Figure A.3. Average monthly runoff volume [ac-ft] in the Chippewa River near Milan, MN (USGS# 05304500).

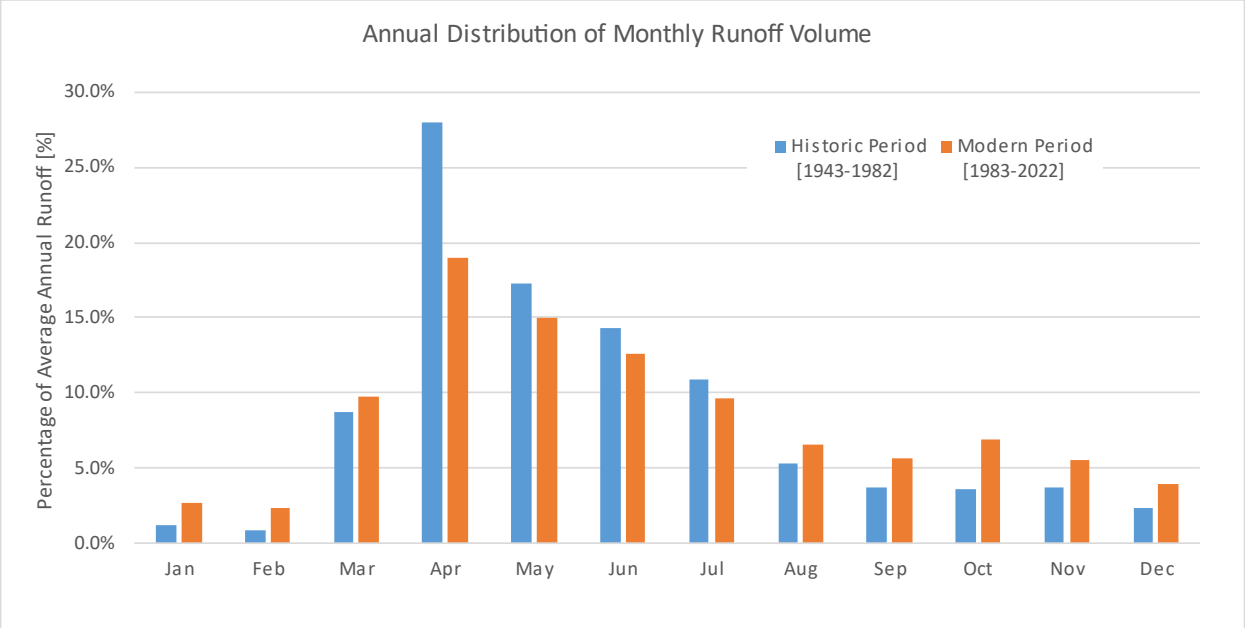


Figure A.4. Annual distribution of average monthly runoff volume as a percentage of annual total volume in the Chippewa River near Milan, MN (USGS# 05304500).

Table A.4. Average monthly runoff volume and annual distribution of monthly runoff volumes in Chippewa River near Milan, MN (USGS# 05304500).

Month	Average Monthly Volumes [ac-ft]	Distribution of Annual Volume

	Historic Period [1943-1982]	Modern Period [1983-2022]	% diff.	AH	Historic Period [1943-1982]	Modern Period [1983-2022]	% diff.	AH
Jan	2,518	12,725	405.3%	+	1.2%	2.7%	123.0%	+
Feb	1,941	11,353	484.9%	+	0.9%	2.4%	158.1%	+
Mar	18,046	45,898	154.3%	+	8.7%	9.8%	12.2%	+
Apr	58,026	89,229	53.8%	+	28.0%	19.0%	-32.1%	-
May	35,893	70,791	97.2%	+	17.3%	15.0%	-13.0%	-
Jun	29,654	59,340	100.1%	+	14.3%	12.6%	-11.7%	-
Jul	22,732	45,542	100.3%	+	10.9%	9.7%	-11.6%	-
Aug	11,138	31,035	178.6%	+	5.4%	6.6%	23.0%	+
Sep	7,643	26,734	249.8%	+	3.7%	5.7%	54.4%	+
Oct	7,475	32,747	338.1%	+	3.6%	7.0%	93.3%	+
Nov	7,691	26,210	240.8%	+	3.7%	5.6%	50.4%	+
Dec	4,842	18,797	288.2%	+	2.3%	4.0%	71.3%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period
AH means altered hydrology criterion

A.2.2 Timing of Annual Maximum and Minimum Flows

The timing of the annual maximum daily discharge and annual minimum daily discharge are important metrics of the annual distribution of flows. The timing of the annual maximum typical occurs during the spring flood and the timing of the annual minimum usually occurs during the winter months. **Table A.5** provides statistics on the Julian day of the annual maximum flow and **Table A.6** provides the Julian day for the annual minimum flow. The statistics include the average, the median, and the standard deviation of the Julian days when the maximum or minimum flow occur.

Table A.5. Julian Day of annual maximum in the Chippewa River near Milan, MN (USGS# 05304500).

Statistic	Historic Period [1943-1982]	Modern Period [1983-2022]	% diff.	AH
Average	29-Apr	31-May	26.29%	+
Median	13-Apr	12-Jun	58.25%	+
Standard Deviation	45 days	62 days	39.08%	+

[1]Based on 365-day year.
+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period
AH means altered hydrology criterion

Table A.6. Julian Day of annual minimum flow in the Chippewa River near Milan, MN (USGS# 05304500).

Statistic	Historic Period [1943-1982]	Modern Period [1983-2022]	% diff.	AH
Average	4-Apr	31-May	59.77%	+
Median	12-Feb	7-May	196.51%	+
Standard Deviation	104 days	116 days	11.91%	+

[1]Based on 365-day year.
+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period
AH means altered hydrology criterion

A.3 RIPARIAN FLOODPLAIN (LATERAL) CONNECTIVITY (PEAK FLOWS)

The riparian floodplain connectivity metrics represent the frequency and duration of flooding of the riparian area and the lateral connectivity between the stream and the riparian area. Functions include energy flow, deposition of sediment, channel formation and surface water – groundwater interactions. The riparian floodplain connectivity metrics include the discharge rates for the 10-year, the 25-year, the 50-year, and the 100-year peak discharges. The annual peak discharge rates for select return periods (1.01-year, 1.5-year, 2-year, 5-year, 10-year, 25-year, 50-year, 100-year, and 200-year) are shown in **Figure A.5**.

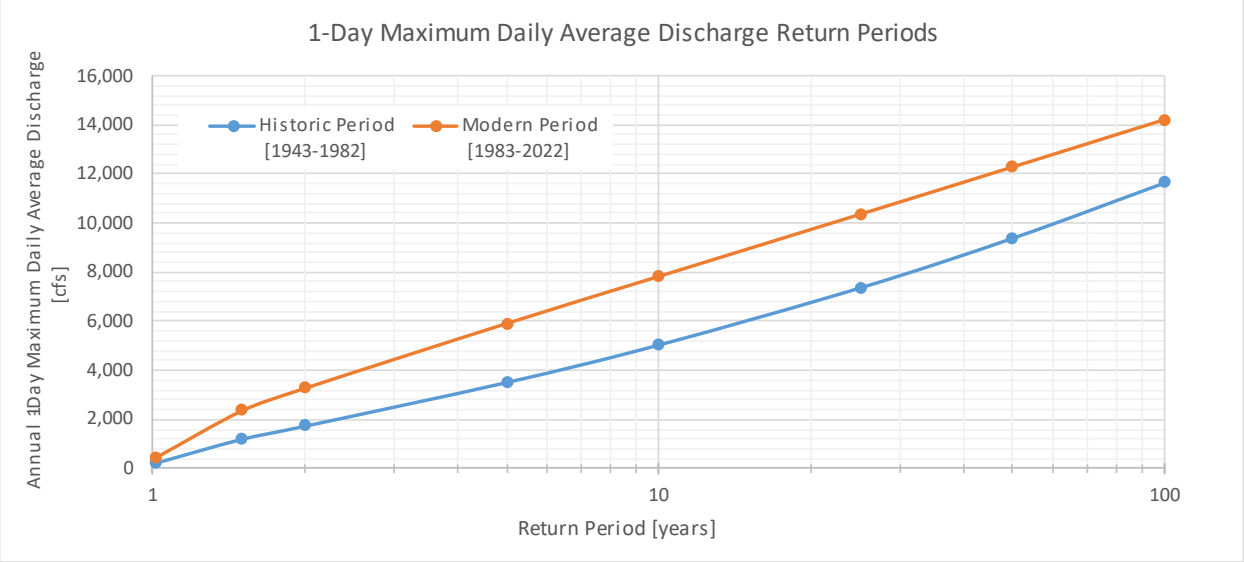


Figure A.5. Historical versus modern peak discharge return periods for Chippewa River near Milan, MN (USGS# 05304500).

In addition, the number of years with discharges exceeding the historic peak discharge within a period, the average number of days above the historic peak discharge rates, and the average cumulative volume of discharge above the historic peak discharges are provide (**Table A.7**).

Table A.7. Riparian floodplain connectivity metrics for the Chippewa River near Milan, MN (USGS# 05304500).

Flow Metric	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.[1]	Altered Hydrology
5-Year Peak Discharge, Q(5) [cfs]	3,519	5,923	68.3%	+
Number of years with Discharge (Q) > Q_H (5)	8	17	112.5%	+
Average number of days per year Q > Q_H (5)	7	12	83.0%	+
Average annual cumulative volume > Q_H (5) [ac-ft]	22,182	43,115	94.4%	+
10-Year Peak Discharge, Q(10) [cfs]	5,046	7,838	55.3%	+
Number of years with Discharge (Q) > Q_H (10)	4	12	200.0%	+
Average number of days per year Q > Q_H (10)	6	7	24.2%	+
Average annual cumulative volume > Q_H (10) [ac-ft]	17,173	27,432	59.7%	+
25-Year Peak Discharge, Q(25) [cfs]	7,371	10,363	40.6%	+
Number of years with Discharge (Q) > Q_H (25)	1	6	500.0%	+
Average number of days per year Q > Q_H (25)	5	4	-13.3%	-
Average annual cumulative volume > Q_H (25) [ac-ft]	17,683	17,357	-1.8%	o
50-Year Peak Discharge, Q(50) [cfs]	9,389	12,283	30.8%	+
Number of years with Discharge (Q) > Q_H (50)	1	2	100.0%	+
Average number of days per year Q > Q_H (50)	3	6	83.3%	+
Average annual cumulative volume > Q_H (50) [ac-ft]	2,329	19,830	751.4%	+
100-Year Peak Discharge, Q(100) [cfs]	11,649	14,214	22.0%	+
Number of years with Discharge (Q) > Q_H (100)	0	1	NA	o
Average number of days per year Q > Q_H (100)	0	3	NA	o
Average annual cumulative volume > Q_H (100) [ac-ft]	0	7,247	NA	o

[1]No events occurred above return period discharge.
+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

A.4 GEOMORPHIC STABILITY AND CAPACITY TO TRANSPORT SEDIMENT

The geomorphic stability and capacity to transport sediment metrics are related to the channel forming discharge. An increase in these metrics would be interpreted as an increase in the risk of the stream channel susceptibility to erosion. These metrics include changes to the flow duration curves, the 1.5-year peak flow, the 2-year peak flow. The 1.5-year to 2-year peak flows are generally consider the range of channel forming flow. In addition, the number of years within a period exceeding the historic peak flows, the average number of days above the historic peak flow rates, and the average volume of flow above the historic peak flows are provide (**Table A.8**). **Figure A.6** is the flow duration curves for the historic and modern periods and **Table A.8** provides a summary of flows for select percent exceedances. Both show that discharges across the flow spectrum have increased substantially, with the exception of the very high flows.

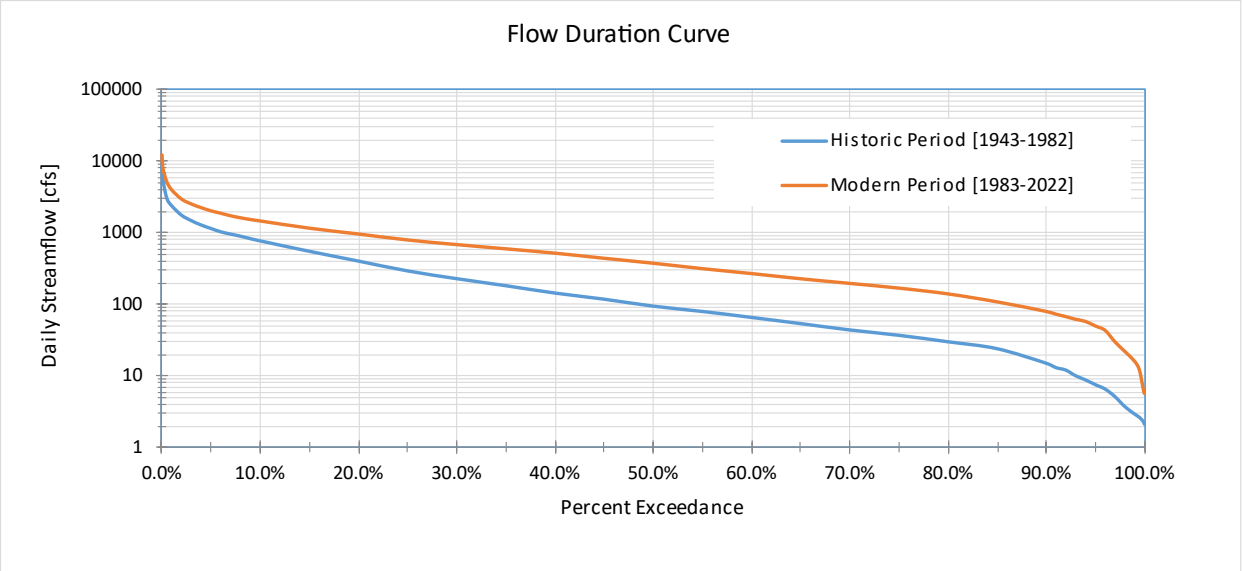


Figure A.6. Historical versus modern flow duration for Chippewa River near Milan, MN (USGS# 05304500).

Table A.8. Select summary of the flow duration curves for the Chippewa River near Milan, MN (USGS# 05304500).

Percent Exceedance	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.	Altered Hydrology
0.10%	5,757	8,285	43.9%	+
1.0%	2,439	4,069	66.8%	+
10.0%	784	1,490	90.0%	+
25.0%	297	806	171.4%	+
50.0%	95	380	300.0%	+
75.0%	44	198	350.0%	+
90.0%	15	80	433.3%	+
99.0%	3	16	451.7%	+
99.9%	2	6	181.3%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

Table A.9 provides the 1.5-year and 2-year annual peak flows and flow statistics, including peak discharge, number of years with flow rates above the historic return period flow, average number of days per year above the historic return period flow, and average volume above the historic return period flow.

Table A.9. Geomorphic stability and capacity to transport sediment metrics for the Chippewa River near Milan, MN (USGS# 05304500).

Flow Metric	Historic Period [1943-1982]	Modern Period [1983-2022]	% Diff.	Altered Hydrology
1.5-Year Peak Discharge, Q(1.5) [cfs]	1,208	2,374	96.6%	+
Number of years with Discharge (Q) > Q_H (1.5)	25	37	48.0%	+
Average number of days per year Q > Q_H (1.5)	27	57	109.8%	+
Average annual cumulative volume > Q_H (1.5) [ac-ft]	46,684	109,117	133.7%	+
2-Year Peak Discharge, Q(2) [cfs]	1,743	3,293	89.0%	+
Number of years with Discharge (Q) > Q_H (2)	19	31	63.2%	+
Average number of days per year Q > Q_H (2)	16	34	104.3%	+
Average annual cumulative volume > Q_H (2) [ac-ft]	35,052	78,514	124.0%	+

+ symbol indicates metric exhibits altered hydrology and an increase for the modern period compared to the historic period
o symbol indicates fails to exhibit altered hydrology for the modern period compared to the historic period
- symbol indicates metric exhibits altered hydrology and a decrease for the modern period compared to the historic period

A.5 SETTING GOALS

A summary of the storage goals is provided in **Table 4** in **Section 4.** The following are the methods used to develop those goals. Goals for addressing the change in hydrology were estimated using three methods. Each method is based on different assumptions and altered the metrics for a specific "altered hydrology" group (see Table 11). The first method is focused on the aquatic habitat and geomorphic and ability to transport sediment metric group and uses the change in the cumulative volume for mean daily discharges, exceeding the 1.5-year return period event. The cumulative total volume when the daily average discharge exceeds the 1.5-year peak discharge includes all flows above the 1.5-year peak, i.e. can include storms with much larger return periods. The change in average annual cumulative volume above the 1.5-year peak flow (see **Table A.9**) This method is based on the changes in the observed data and since it includes all flows above the 1.5-year flow relies on the two periods to have a similar distribution of flows. The storage goal based on observed flows is **62,434 AF or 0.62 inches** across the watershed.

The second method is based on the changes in hydrology across the entire annual hydrograph and integrates the differences in return period discharges between the modern and historic period (see **Table A.10**) and finding a probability-weighted representative change in flow rate. A volume is then found by assuming a flow period equal to the change in flow period for the 1.5-year flow (i.e. the change in the number of days above the 1.5-year flow; see **Table A.9**).

Table A.10. Estimated goal for the drainage area of the Chippewa River near Milan, MN (USGS# 05304500) using method 2.

Return Period	Historic Period Discharges (cfs)	Modern Period Discharges (cfs)	Difference (cfs)	Probability of Occurrence	Difference*Probability (cfs)
1.5	1,127	1,208	2,374	1166	0.67

2	1,617	1,743	3,293	1550	0.50
5	3,428	3,519	5,923	2404	0.20
10	5,204	5,046	7,838	2792	0.10
25	8,276	7,371	10,363	2992	0.04
50	11,286	9,389	12,283	2894	0.02
100	15,026	11,649	14,214	2565	0.01
				Sum (cfs):	2,516
				Sum (ac-ft/day):	4,992
		Number of days:	30	**Total Volume Goal:**	149,978 AF (1.50 in.)

The third method is also based on addressing the effects through the entire flow range and is a revision to Method 2. Method 3 considers incorporates the observed change in the timing of the peak discharge for each return period event. This method uses the probability-weighted representative change in flow rate and multiples the flow rates by the change in the number of days exceeding the return period flow for each return period (see **Table A.11**).

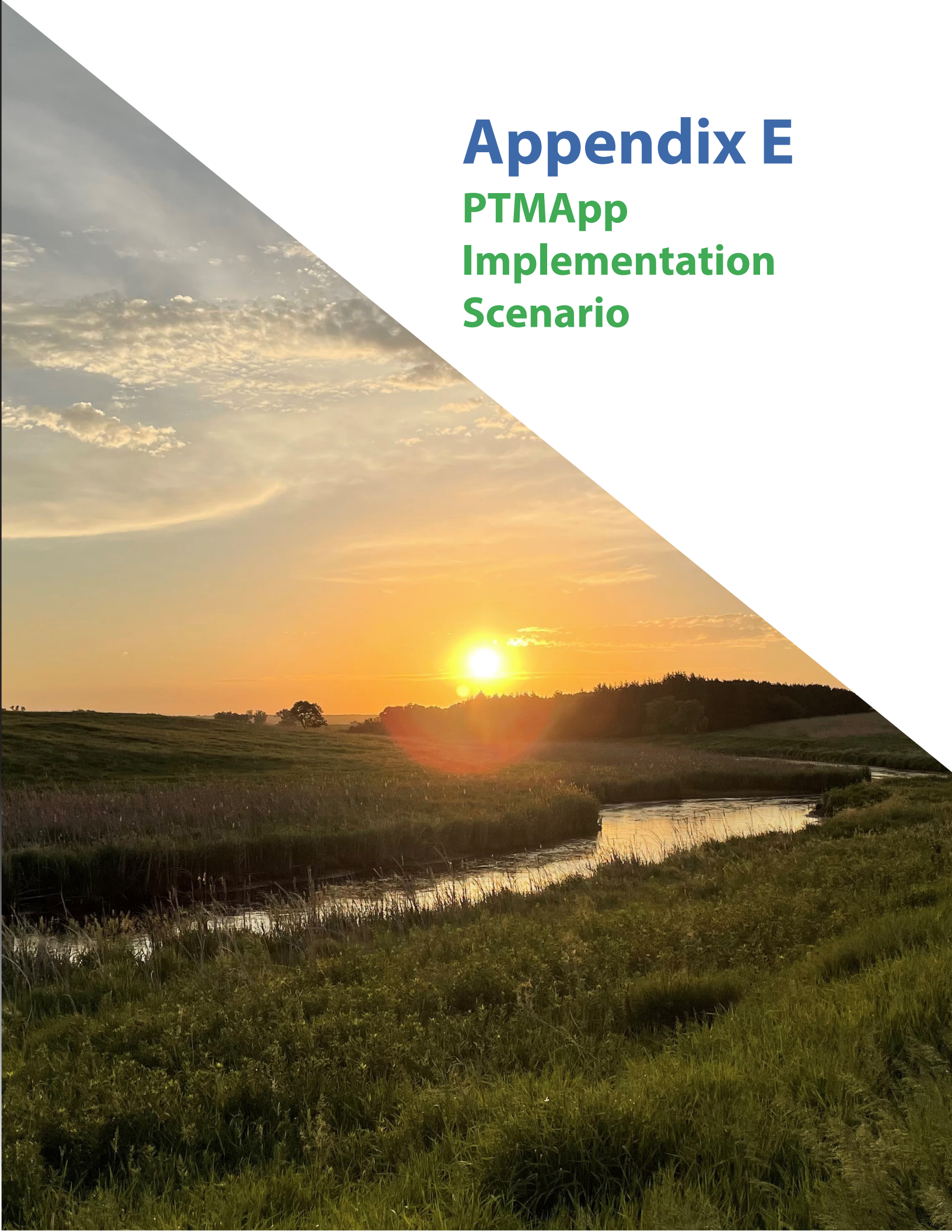
Table A.11. Estimated goal for the drainage area of the Chippewa River near Milan, MN (USGS# 05304500) using method 3.

Return Period	Change in Flow (Q_m-Q_h) [cfs]	Probability of Occurrence	Probability Weighted Flow [AF/day]	Change in number of days above flow (days)	Storage Volume
1.5	1,166	0.67	1,542.7	30	46,352
2	1,550	0.50	1,538.1	17	26,343
5	2,404	0.20	953.8	6	5,344
10	2,792	0.10	554.0	1	739
25	2,992	0.04	237.4	0	0
50	2,894	0.02	114.8	3	287
100	2,565	0.01	50.9	3	153
				Total Volume Goal:	79,217 AF (0.79 in.)

The fourth method integrates the changes in the FDC (see Figure A.6) and the probability of occurrence of each flow, also known as the expected number of the FDC. The fourth method estimated a storage goal of **73,203 AF, or 0.73 inches,** across the watershed.

Appendix E

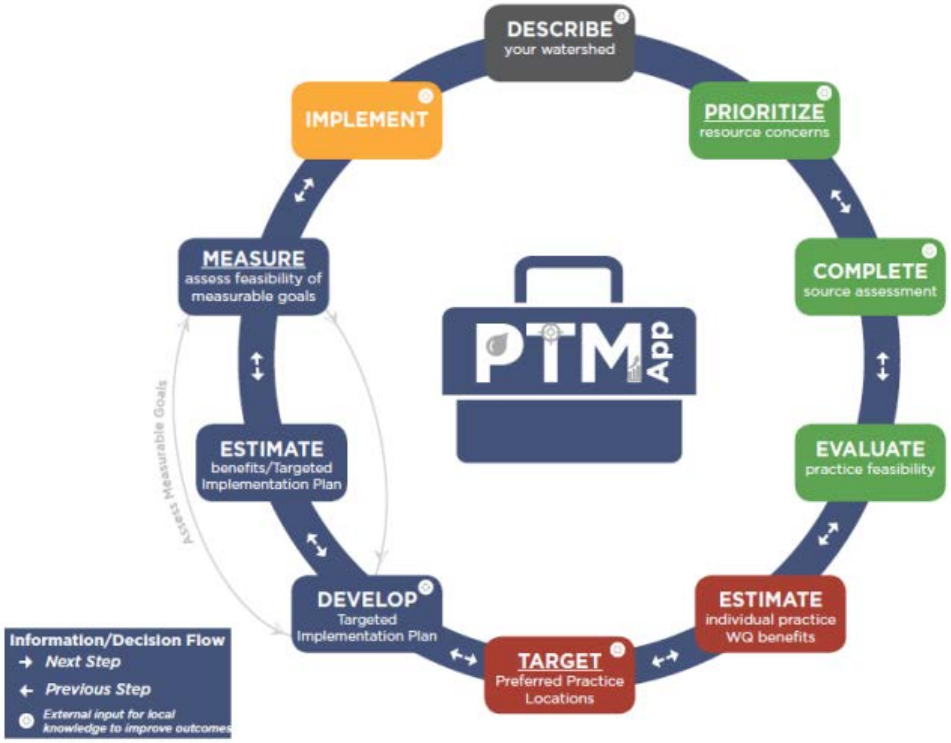
PTMApp Implementation Scenario



PTMApp Implementation Scenario

Actions in **Section 5. Targeted Implementation** of this plan are based on a PTMApp Implementation Scenario developed by the Technical Advisory Committee during the Chippewa River Watershed 1W1P planning process. For the purpose of planning, this implementation scenario is summarized more broadly in **Section 5** to enable flexibility during implementation. This Appendix details the decisions made and shows the best management practices (BMP) targeting maps that resulted from the implementation scenario.

Introduction



The Prioritize, Target, and Measure Application (PTMApp) is a program that can be used by practitioners as a technical bridge from general descriptions of implementation strategies in a local water plan to the identification of implementable on-the-ground BMPs and conservation practices.

PTMApp can be used by Soil and Water Conservation Districts (SWCD), watershed districts, county and local watershed planners, and agency staff and decision-makers to **prioritize** resources and the issues impacting them, **target** specific fields to place practices, and **measure** water quality improvement by estimating the expected nutrient and sediment load reductions delivered to priority resources.

The tool enables practitioners to build prioritized and targeted implementation scenarios, measure the cost-effectiveness of the scenario for improving water quality, and report the results to pursue funds for project implementation.

Chippewa PTMApp Approach

The TAC discussed the PTMApp decisions in January 2023. The decisions are detailed in **Table 1**.

Table 1. PTMApp decisions to support development of the Chippewa River CWMP.

Decision	Implications	TAC Decision
Criteria used to further screen practices	Criteria are used to further screen practices considered technically feasible for implementation but are not practicable to implement.	See **Table 2**.
Types of practices to include	Determines types of NRCS practices that are included in the implementation scenario.	See **Table 3**.
Costs	Costs can represent the "cost" share or total cost. For example, EQIP is the federal government cost share.	Double EQIP Costs to capture the full cost of the practice + 20% for technical assistance. Soil Health: $150/acre, based off local feedback on a realistic 3-year cost-share.
Spatial Scale	The decision reflects the spatial scale for application of the load reduction goals. For example, will the ability of the proposed BMPs to achieve the sediment, TP, and TN load reduction goal be assessed at the field edge or some other spatial scale. This decision also affects which BMPs are selected as best. The "best" practice locations tend to be near the location where the load reduction is desired. Using the edge of field will tend to spread practices more evenly across the landscape. Use of a planning region outlet will tend to concentrate the practices upstream of that location.	The "best" practices selected based on the highest load reduction (using the 10-year event) at the edge of the field (spreads out practices within the planning region). Practices for the Projects and Support Implementation Program capped (initially) at $250,000 (rationale: anything over $250,000 is a Capital Improvement Project).
Parameters and method used to rank the "best" conservation practices.	The "best" conservation practices will differ depending on which parameters are used, and whether they are weighted.	Best conservation practices evaluated by load reduction benefits for total phosphorus.
Process for identifying the number of practices which will be included in the Implementation Scenario	Decision ultimately affects the "cost(s)" of the Implementation Scenario and ability to achieve the load reduction goals.	Number of practices that can be afforded under the Funding Level 2 (Current Funding + Watershed-Based Implementation Funding).

Feasible PTMApp practice outputs were screened based on screening criteria agreed upon by the TAC (**Table 2**). Using the screening criteria, practices with low potential for water quality benefits were removed from the analysis. Reduction efficiency criteria were set to immediately rule out structural or management practices that would be minimally effective. Two criteria were evaluated- BMPs must reduce loads by at least 10% and treat 50% of a 2-year rain event, and BMPs must reduce a significant amount of load (at least 0.25 tons of sediment/year and 0.25-0.5 lbs nutrients/year). Efficiencies for BMPs with N/A in Table 2 are uniform for all BMPs of a given type, and are not screened by that criteria as a result.

Table 2: Screening Criteria Approved by the TAC

Conservation Practice Name	PTMApp NRCS Practice Code	Remove BMPs with little runoff volume delivery or constituent removal efficiency				Remove BMPs with low removal magnitudes at the edge of field		
		Delivery and Reduction Efficiency Criteria (Value must be greater than)				Reduction Magnitude Selection Criteria (Value must be greater than)		
		Percent of 2-yr, 24-hr event treated	Sediment Reduction (%)	TP Reduction (%)	TN Reduction (%)	Sediment Reduction @ Catchment Outlet (tons/year)	TP Reduction @ Catchment Outlet (lbs/year)	TN Reduction @ Catchment Outlet (lbs/year)
Farm Pond/Wetland	378	50	10	10	10	0.25	0.25	0.5
Drainage Water Management	554	50	10	10	10	0.25	0.25	0.5
Water and Sediment Control Basin	638	50	10	10	10	0.25	0.25	0.5
Regional Wetland/Pond	656_1	50	10	10	10	0.25	0.25	0.5
Large Wetland Restoration	656_2	50	10	10	10	0.25	0.25	0.5
Riparian Buffer	390	50	10	10	10	0.25	0.25	0.5
Filtration Strip	393	50	10	10	10	0.25	0.25	0.5
Saturated Buffer	604	50	10	10	10	0.25	0.25	0.5
Denitrifying Bioreactor	605	50	10	10	10	0.25	0.25	0.5
Infiltration Trench/Small Infiltration Basin	350	50	10	10	10	0.25	0.25	0.5
Multi-stage Ditch (open channel)	582	50	10	10	10	0.25	0.25	0.5
Critical Area Planting	342	N/A				0.25	0.25	0.5
Grade Stabilization	410	N/A				0.25	0.25	0.5
Grassed Waterway	412	N/A				0.25	0.25	0.5
Lake and Wetland Shoreline Restoration	580	N/A				0.25	0.25	0.5
Perennial Crops	327	N/A				0.25	0.25	1
No till	329	N/A				0.25	0.25	1
Cover Crops	340	N/A				0.25	0.25	1
Reduced till	345	N/A				0.25	0.25	1
Forage / Biomass Planting	512	N/A				0.25	0.25	1
Prescribed Grazing	528	N/A				0.25	0.25	1

Conservation Practice Name	PTMApp NRCS Practice Code	Remove BMPs with little runoff volume delivery or constituent removal efficiency				Remove BMPs with low removal magnitudes at the edge of field		
		Delivery and Reduction Efficiency Criteria (Value must be greater than)				Reduction Magnitude Selection Criteria (Value must be greater than)		
		Percent of 2-yr, 24-hr event treated	Sediment Reduction (%)	TP Reduction (%)	TN Reduction (%)	Sediment Reduction @ Catchment Outlet (tons/year)	TP Reduction @ Catchment Outlet (lbs/year)	TN Reduction @ Catchment Outlet (lbs/year)
Nutrient Management Plan of Groundwater	590_1	N/A				0.25	0.25	1
Nutrient Management Plan for Phosphorus	590_2	N/A				0.25	0.25	
Nutrient Management Plan for Nitrogen	590_3	N/A				0.25		1

After practices were screened, the remainder were ranked by their total phosphorus reduction potential at the catchment outlet from highest to lowest. This ranking highlighted all practices with the potential to reduce the most total phosphorus at the edge of the field where the practice would be located.

Each NRCS conservation practice was allotted a certain amount of funding based on scenario estimates by the TAC, as shown in **Table 3.** Targeted practices were selected from the highest position on the ranked list (most total phosphorus reduction potential) until each practice funding limit was reached.

Table 3: NRCS Conservation Practices and associated priority for funding (high, or low)

Conservation Practice Name	NRCS Practice Code	Priority
Farm Pond/Wetland	378	L
Drainage Water Management	554	H
Water and Sediment Control Basin	638	H
Large Wetland Restoration	656_1†	L
Regional Wetland/Pond	656_2†	L
Riparian Buffer	390	L
Filtration Strip	393	H
Saturated Buffer	604	L
Denitrifying Bioreactor	605	0
Infiltration Trench/Small Infiltration Basin	350	L – Urban is H
Multi-stage Ditch (open channel)	582	L
Critical Area Planting	342	H
Grade Stabilization	410	H
Grassed Waterway	412	H

Conservation Practice Name	NRCS Practice Code	Priority
Lake and Wetland Shoreline Restoration	580	H
Soil Management Practices (Conservation Cover, Conservation Crop Rotation, Perennial Crops, No till, Cover Crops, Reduced Till, Nutrient Management, Prescribed Grazing)	340	H
Forage / Biomass Planting	512	L

PTMApp Implementation Scenarios

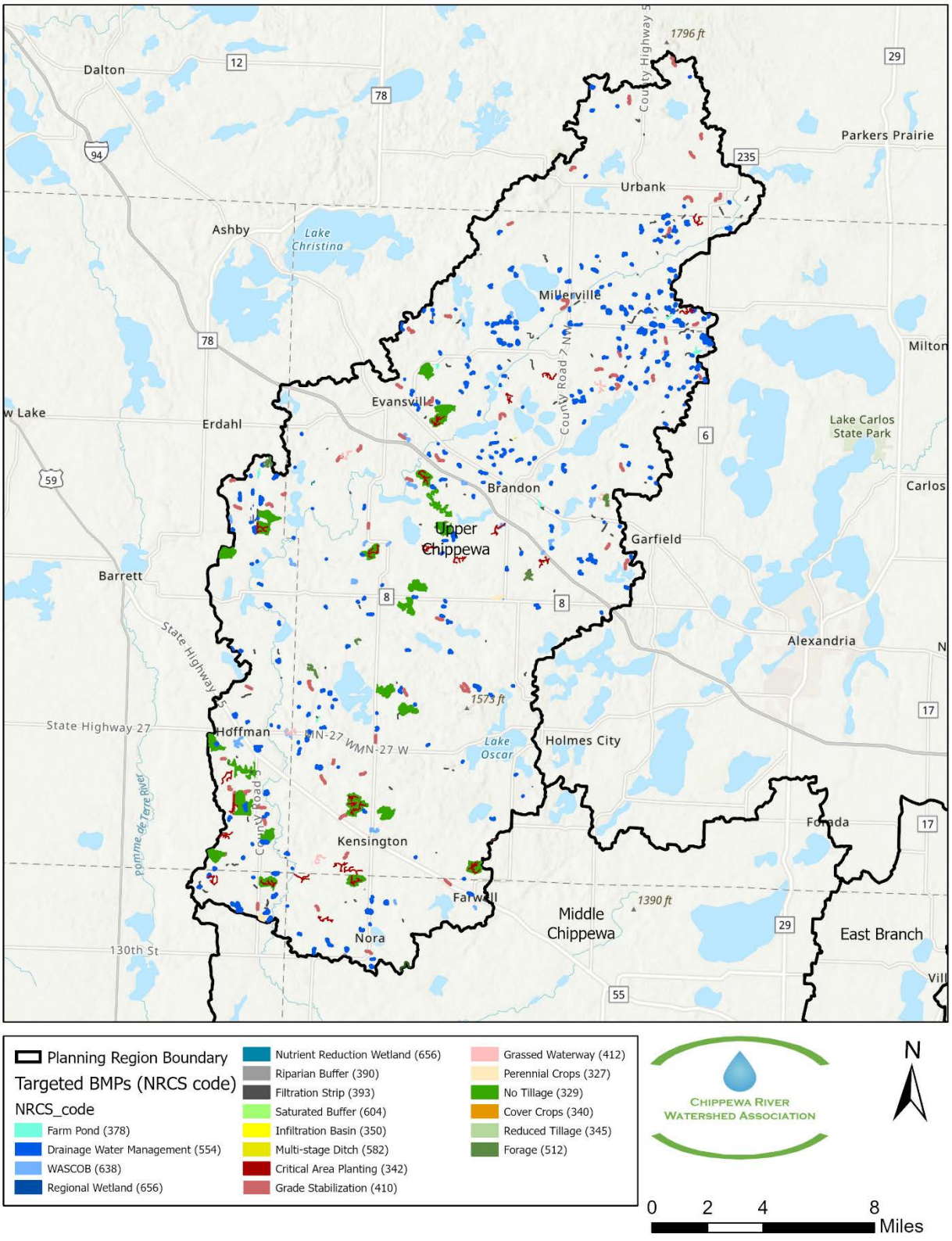
Upper Chippewa Planning Region

The Table below shows the PTMApp implementation scenario results for the **Upper Chippewa Planning Region**. The next page includes a map showing where practices are located.

Table 4. Upper Chippewa Planning Region PTMApp outputs

BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	8	$86,617	3,851	582	11,724	2,685
554 - Drainage water management	335	$222,708	8,429	1,475	24,464	8,623
638 - WASCOB	23	$248,400	1,022	275	2,221	899
656_1 - Regional wetland	6	$71,130	262	22	612	189
656_2 Large wetland restoration	2	$71,458	161	7	261	85
390 - Riparian Buffer	23	$76,753	211	70	1,163	538
393 - Filtration Strip	104	$221,858	210	73	1,288	467
350 - Infiltration Trench/Small Infiltration Basin	2	$130,886	3	1	12	17
582 - Multi-stage Ditch	1	$7,239	8	0	18	5
342 - Critical Area Planting	25	$224,641	553	108	2,197	319
410 - Grade Stabilization	63	$252,000	870	49	933	138
412 - Grassed Waterway	8	$244,653	250	35	634	96
340 - Cover Crops	27	$474,281	4,984	800	15,046	3,162
512 - Forage / Biomass Planting	5	$14,169	786	37	300	132
Scenario 1 Total	**632**	**$2,346,793**	**21,600**	**3,534**	**60,873**	**17,354**

Figure 1: BMPs in the Upper Chippewa Planning Region.



PTMApp Implementation Scenarios

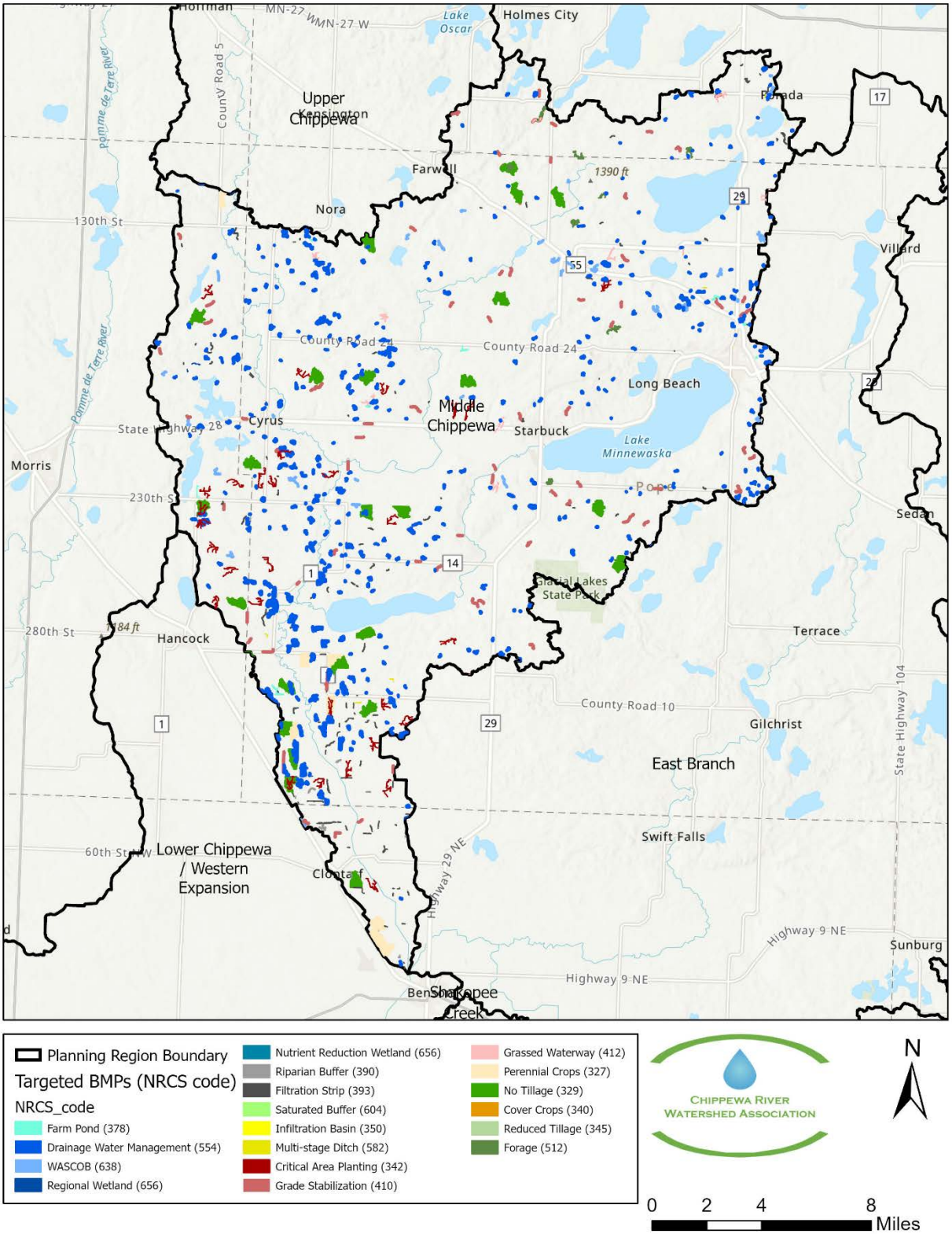
Middle Chippewa Planning Region

The Table below shows the PTMApp implementation scenario results for the **Middle Chippewa Planning Region**. The next page includes a map showing where practices are located.

Table 5. Middle Chippewa PTMApp outputs

BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	13	$111,075	4,503	995	19,339	4,092
554 - Drainage water management	435	$289,188	10,790	2,041	33,750	11,653
638 - WASCOB	31	$334,800	1,324	393	3,272	1,204
656_1 - Regional wetland	2	$177,499	1,769	101	4,032	1,843
390 - Riparian Buffer	14	$142,717	110	65	1,171	445
393 - Filtration Strip	144	$288,495	401	156	2,913	905
604 - Saturated Buffer	1	$3,020	24	2	59	17
350 - Infiltration Trench/Small Infiltration Basin	3	$130,886	4	2	17	28
582 - Multi-stage Ditch	5	$50,351	25	1	78	21
342 - Critical Area Planting	30	$307,494	650	148	3,008	436
410 - Grade Stabilization	72	$288,000	950	57	1,071	159
412 - Grassed Waterway	10	$286,140	341	39	753	112
340 - Cover Crops	36	$638,649	3,830	1,115	16,933	4,258
512 - Forage / Biomass Planting	8	$19,088	583	50	406	177
Scenario 1 Total	804	$3,067,402	25,304	5,167	86,801	25,350

Table 2: BMPs in the Middle Chippewa Planning Region.



PTMApp Implementation Scenarios

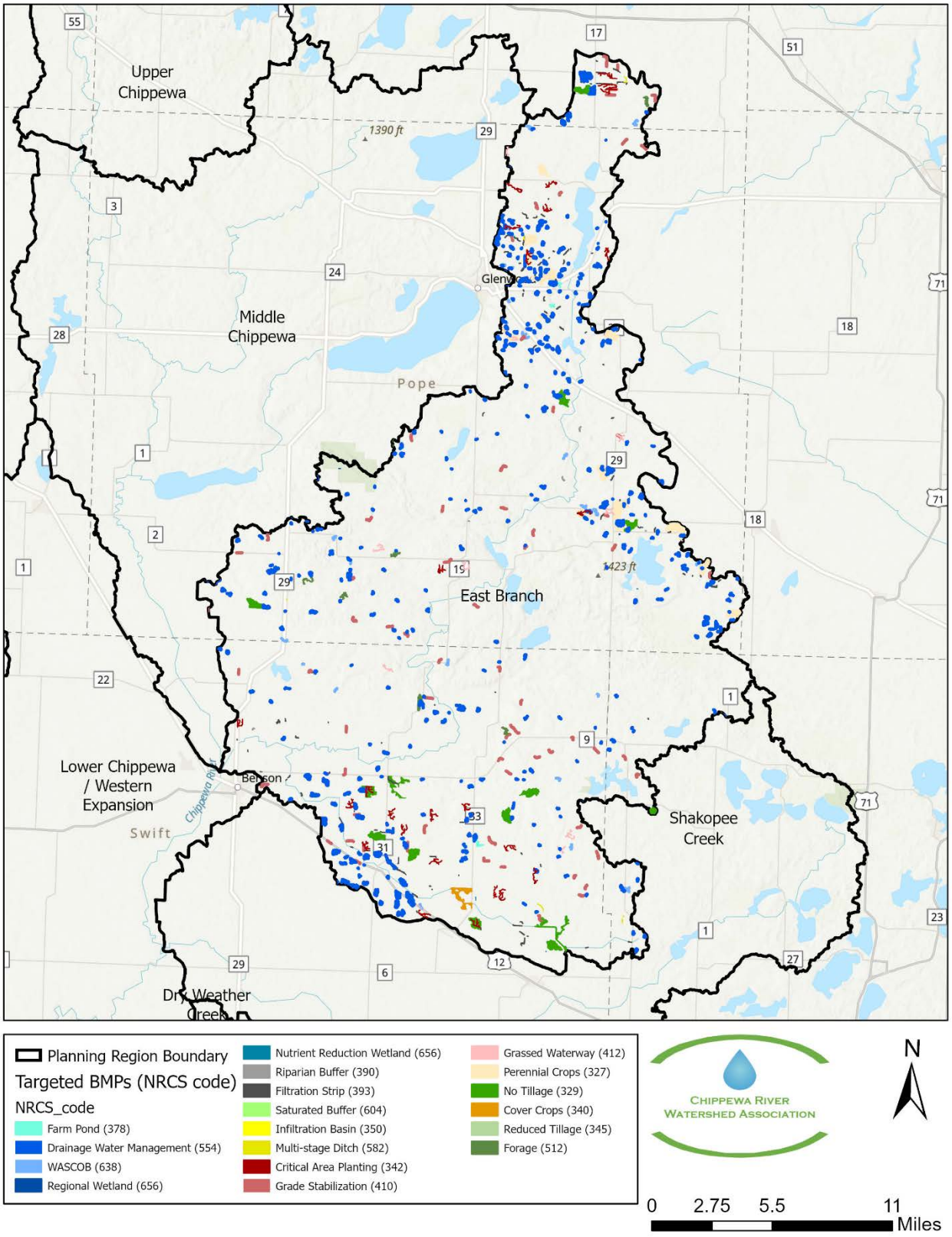
East Branch Planning Region

The Table below shows the PTMApp implementation scenario results for the **East Branch Planning Region**. The next page includes a map showing where practices are located.

Table 6. East Branch PTMApp outputs

BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	5	$88,428	1,540	515	10,370	2,003
554 - Drainage water management	402	$267,250	9,958	2,113	35,888	11,911
638 - WASCOB	25	$270,000	1,110	303	2,892	972
656_1 - Regional wetland	3	$87,277	305	27	928	382
656_2 – Large wetland restoration	5	$89,895	59	10	282	73
390 - Riparian Buffer	11	$87,370	123	59	967	389
393 - Filtration Strip	113	$267,567	373	146	2,675	825
350 - Infiltration Trench/Small Infiltration Basin	1	$82,863	2	1	8	6
582 - Multi-stage Ditch	6	$86,633	64	4	220	69
342 - Critical Area Planting	26	$266,819	480	129	2,609	378
410 - Grade Stabilization	66	$264,000	1,109	57	1,081	160
412 - Grassed Waterway	9	$278,941	312	40	731	109
340 - Cover Crops	36	$667,897	4,754	1,177	15,222	4,453
512 - Forage / Biomass Planting	7	$20,012	504	53	424	186
Scenario 1 Total	715	$2,824,950	20,692	4,633	74,297	21,917

Table 3: BMPs in the East Branch Planning Region.



PTMApp Implementation Scenarios

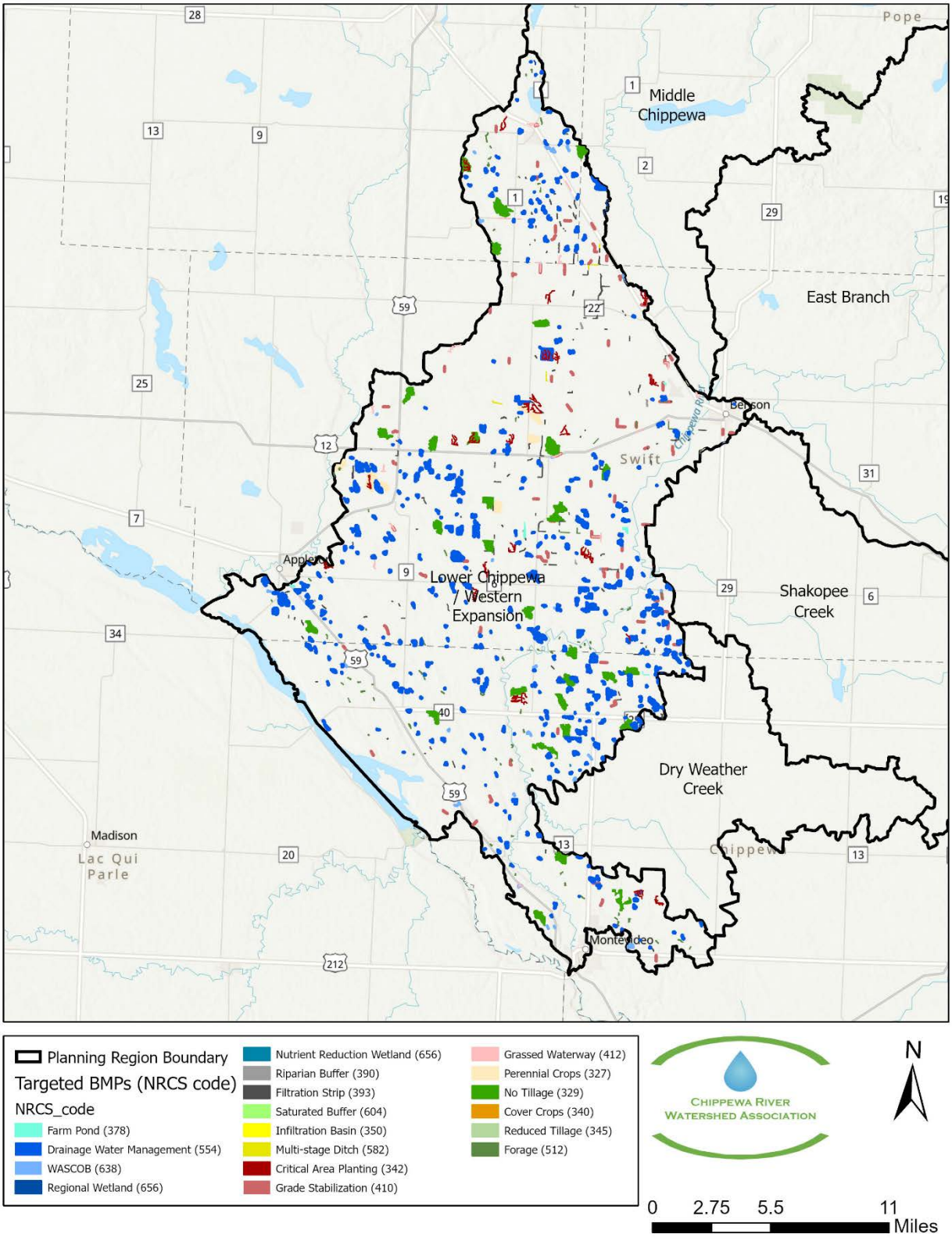
Lower Chippewa / Western Expansion

The Table below shows the PTMApp implementation scenario results for the **Lower Chippewa / Western Expansion Planning Region**. The next page includes a map showing where practices are located.

Table 7. Lower Chippewa / Western Expansion PTMApp outputs

BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	5	$119,501	904	387	7,866	1,523
554 - Drainage water management	456	$303,782	6,851	2,162	34,890	12,255
638 - WASCOB	28	$302,400	635	355	2,229	1,023
656_1 - Regional wetland	1	$96,659	41	7	160	35
656_2 – Large wetland restoration	1	$89,568	78	14	404	88
390 - Riparian Buffer	11	$100,544	129	87	1,371	417
393 - Filtration Strip	150	$302,669	460	217	4,001	1,249
350 - Infiltration Trench/Small Infiltration Basin	1	$85,688	2	1	7	6
582 - Multi-stage Ditch	5	$113,176	32	4	189	52
342 - Critical Area Planting	26	$301,004	470	145	2,945	427
410 - Grade Stabilization	76	$304,000	1,548	65	1,211	179
412 - Grassed Waterway	18	$308,458	326	49	789	121
340 - Cover Crops	42	$765,573	4,589	1,320	21,740	5,104
512 - Forage / Biomass Planting	85	$91,474	2,111	60	487	213
Scenario 1 Total	905	$3,284,494	18,176	4,873	78,288	22,691

Table 4: BMPs in the Lower Chippewa / Western Expansion Planning Region.



PTMApp Implementation Scenarios

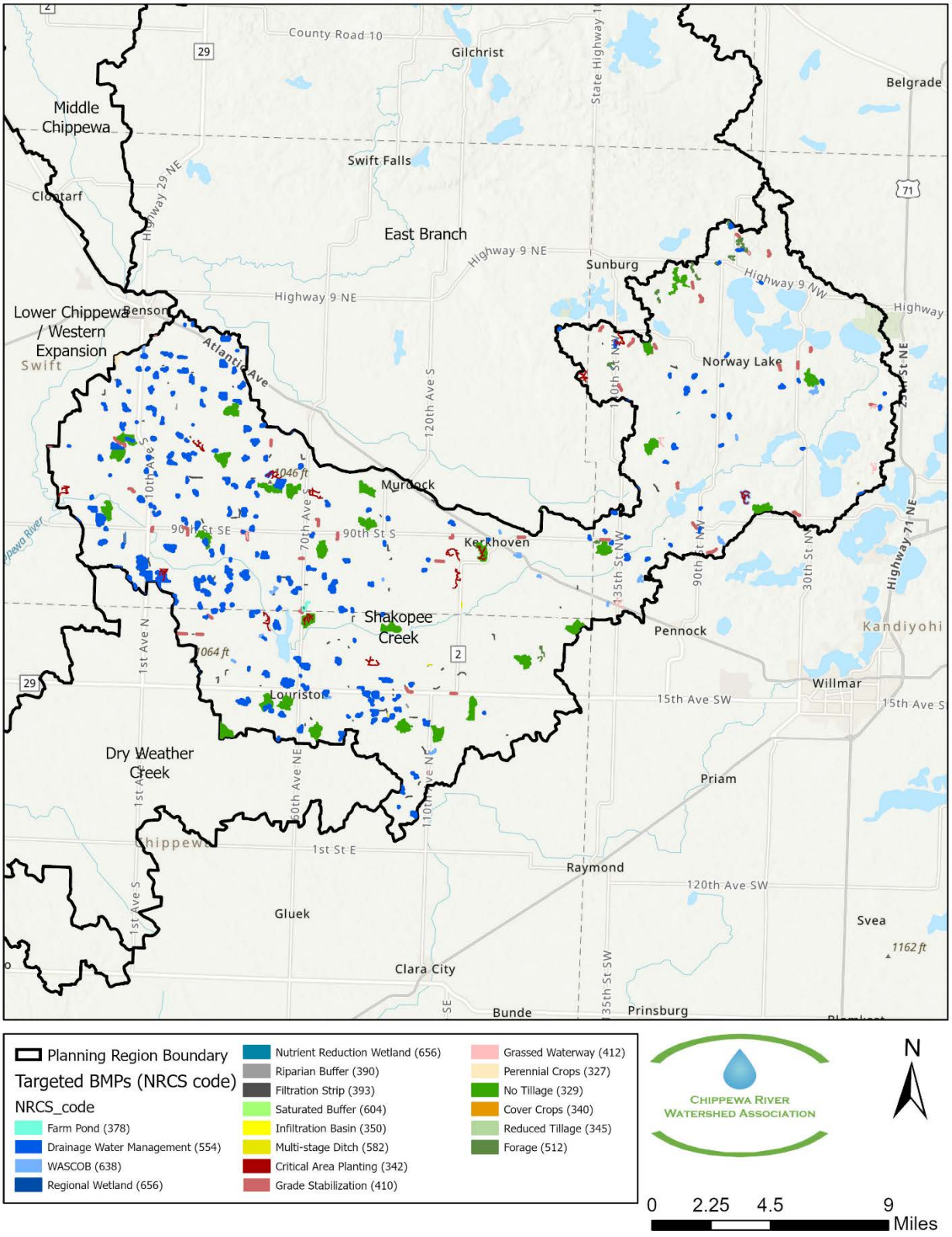
Shakopee Creek Planning Region

The Table below shows the PTMApp implementation scenario results for the **Shakopee Creek Planning Region**. The next page includes a map showing where practices are located.

Table 7. Shakopee Creek PTMApp outputs

BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	1	$45,870	364	120	2,528	460
554 - Drainage water management	225	$149,580	5,061	1,357	22,408	7,257
638 - WASCOB	16	$172,800	500	188	1,450	594
656_1 - Regional wetland	2	$47,566	26	8	217	55
656_2 - Large wetland restoration	2	$46,038	58	6	154	34
390 - Riparian Buffer	6	$44,568	98	32	557	213
393 - Filtration Strip	73	$145,058	249	104	1,738	556
350 - Infiltration Trench/Small Infiltration Basin	1	$64,031	2	0	4	8
582 - Multi-stage Ditch	3	$33,072	24	2	92	28
342 - Critical Area Planting	14	$147,744	259	71	1,446	210
410 - Grade Stabilization	37	$148,000	664	29	557	82
412 - Grassed Waterway	7	$152,825	229	23	394	60
340 - Cover Crops	30	$536,030	3,714	901	16,925	3,574
512 - Forage / Biomass Planting	13	$16,919	973	42	335	147
Scenario 1 Total	430	$1,750,100	12,220	2,883	48,805	13,227

Table 4: BMPs in the Shakopee Creek Planning Region.



PTMApp Implementation Scenarios

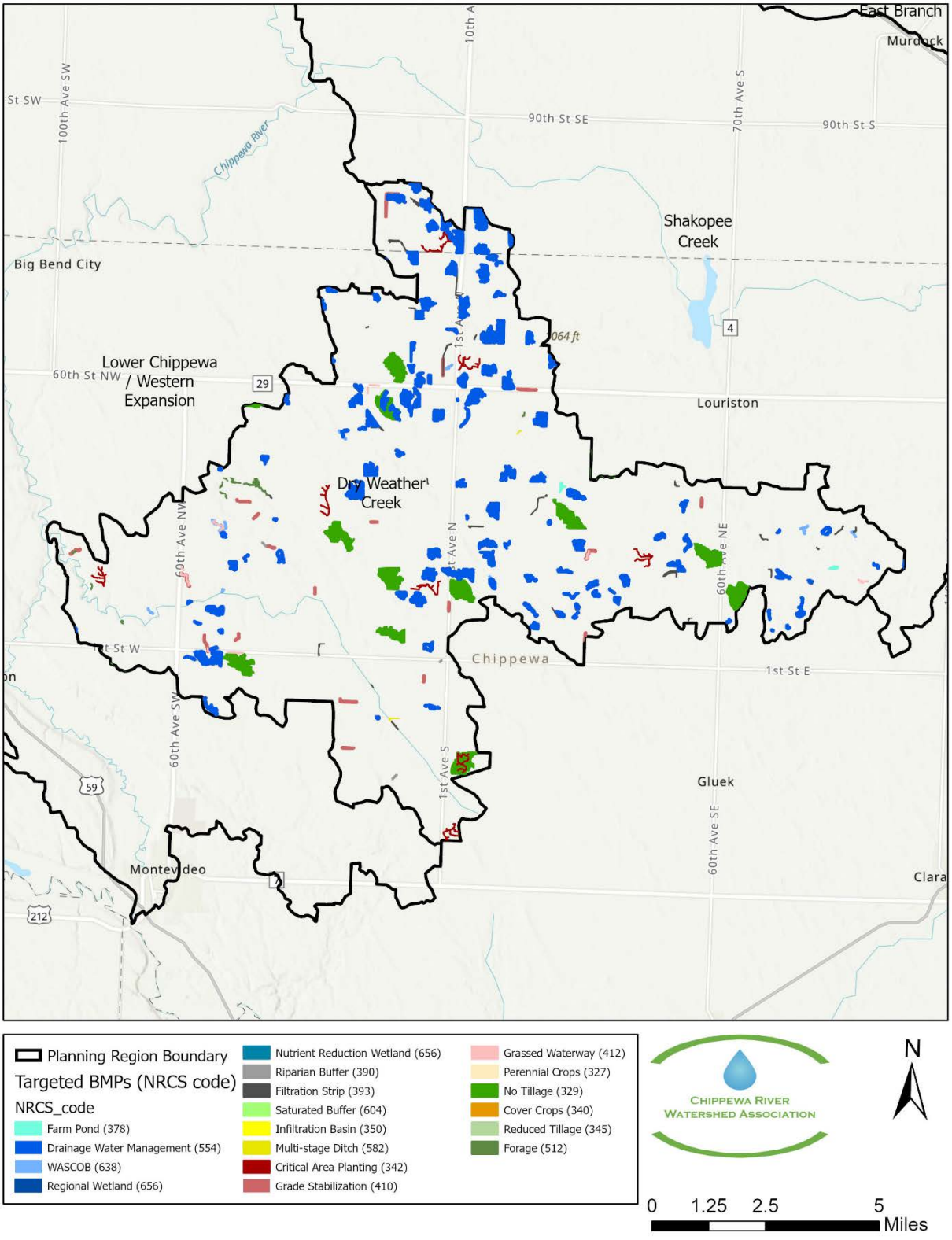
Dry Weather Creek Planning Region

The Table below shows the PTMApp implementation scenario results for the **Dry Weather Creek Planning Region**. The next page includes a map showing where practices are located.

Table 7. Dry Weather Creek PTMApp outputs

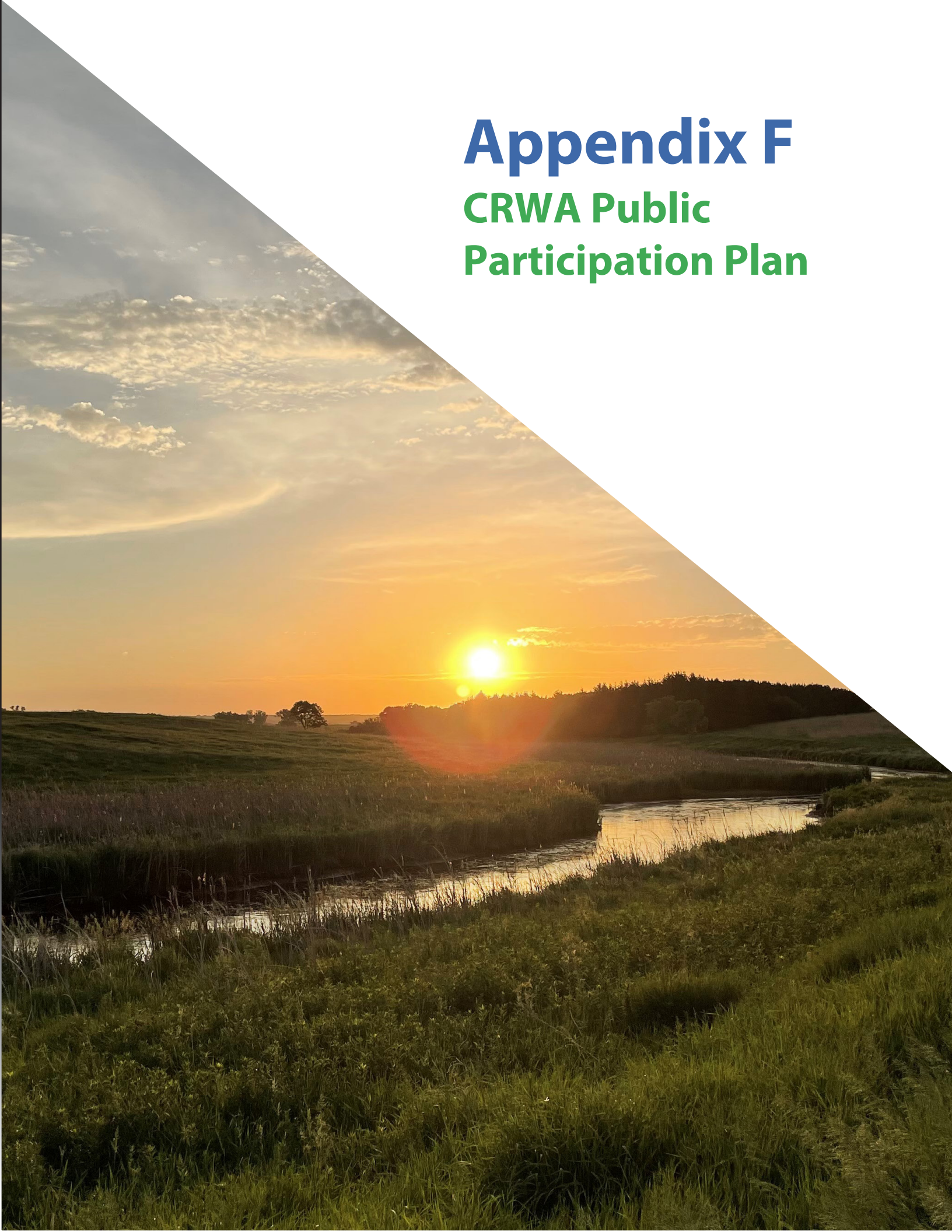
BMP Treatment Group	Number of Practices	Total Cost ($)	Values at Catchment Outlet			Cumulative Surface area (acres)
			Sediment Reduction (tons/yr.)	TP Reduction (lbs./yr.)	TN Reduction (lbs./yr.)	
378 - Farm pond/wetland	2	$29,460	321	162	3,115	646
554 - Drainage water management	123	$81,913	2,538	711	11,990	3,838
638 - WASCOB	8	$86,400	193	88	695	303
656_1 - Regional wetland	1	$47,675	12	3	70	19
390 - Riparian Buffer	3	$28,411	4	17	185	242
393 - Filtration Strip	36	$84,272	113	51	805	290
582 - Multi-stage Ditch	2	$23,613	25	1	68	28
342 - Critical Area Planting	8	$84,118	148	40	824	119
410 - Grade Stabilization	20	$80,000	468	16	281	42
412 - Grassed Waterway	7	$85,804	102	13	221	34
340 - Cover Crops	11	$195,942	1,217	329	6,214	1,306
512 - Forage / Biomass Planting	12	$12,914	151	9	70	30
Scenario 1 Total	233	$840,522	5,292	1,439	24,538	6,898

Table 4: BMPs in the Dry Weather Creek Planning Region.



Appendix F

CRWA Public Participation Plan



12/18/2020

Chippewa River Watershed Restoration and Protection Strategies

Public Participation Plan

Table of Contents

WRAPS INFORMATION

The Chippewa River Watershed Restoration and Protection Strategy (WRAPS) Report was approved by the Minnesota Pollution Control Agency (MPCA) in April of 2017. A complete copy of the report can be found at https://www.pca.state.mn.us/water/watersheds/chippewa-river. This report summarizes the condition of surface water resources, the scale and types of changes needed to restore and protect waters, options and available tools to prioritize and target conservation work on the landscape in the Chippewa River Watershed. This report will be revised every 10 years as a part of the state of Minnesota's "Watershed Approach".

The identified main pollutants in the watershed are sediment, phosphorus, nitrogen, bacteria and dissolved oxygen (D0). The Chippewa River Watershed is one of the more data rich watersheds in Minnesota with some sites having over 20 years of flow and/or water quality data.

The Watershed Approach provides information to local partners, landowners and other stakeholders to prioritize and target conservation practice implementation-to strategically address water quality in the watershed. This report was referenced by the Technical Advisory Committee (TAC) while developing the Public Participation Plan and Prioritization Plan for the watershed.

Chippewa River Watershed Restoration and Protection Strategies

Public Participation Plan

INTRODUCTION TO THE PLAN

The public participation plan purpose is to provide a general awareness of all educational programming in the Chippewa River watershed. The plan identifies existing programming, creates a general public awareness campaign and identifies prioritization where education and further problem investigation can be accomplished to aid in the WRAPS implementation strategies.

The partners worked together to identify general categories: Current Partner Community Educational Programming, K-12 Educational Programming, Chippewa River Watershed Association Community Education, Political, Education, and Data Gaps.

PARTNERS

Chippewa County SWCD	Chippewa County
Douglas SWCD	Douglas County
Grant SWCD	Grant County
Kandiyohi County SWCD	Kandiyohi County
West Otter Tail County SWCD	Otter Tail County
Pope SWCD	Pope County
Stevens County SWCD	Stevens County
Swift County SWCD	Swift County
Board of Water and Soil Resources	Minnesota Pollution Control Agency
Department of Natural Resources	

Chippewa River Watershed Restoration and Protection Strategies

CURRENT PARTNER K-12 EDUCATIONAL PROGRAMMING

NON-SCHOOL EVENTS

The non-school events are typically for school age groups but outside of the school environment.

Fleet Farm Kids Fishing Day (Douglas SWCD)

This is an annual event hosted by Mills Fleet Farm at all the Minnesota Fleet Farm locations. This is a free family friendly event where Douglas SWCD staff teach attendants about water safety, water quality, and aquatic invasive species (AIS). Fleet Farm uses this event to promote new safety and fishing gear. Questions about the state law of Clean, Drain, Dry, Dispose are answered by SWCD staff, as well as discussions about AIS outbreaks or new infestations within the county.

Youth Outdoor Activity Day (Douglas SWCD)

This annual, family friendly event provides youth a fun environment in which to learn about outdoor recreation. Over 45 hands-on activities are available, including trap shooting, archery, hunting, and angling. This event is made possible through a large group of volunteer organizations, businesses, individuals, and donors. Both Douglas SWCD and Douglas County Land and Resources partner to be donors, and have staff helping with the event. This year a total of 2,105 youth participated in the event.

4-H Sessions (Douglas SWCD)

Douglas SWCD Staff has attended different 4-H club meetings as guest presenters to talk about conservation practices and the how kids can relate them to their 4-H Projects. The topics covered are soil health, water quality, aquatic invasive species, and general conservation.

Compass Club (Douglas SWCD)

Compass club is a summer and after school program through the District 206 Schools. Every week during the school year, Douglas SWCD staff attends one of seven schools to teach children about natural resources, conservation, agriculture, and other environmentally friendly topics. The class sizes range from 9-40 students, and sessions are usually 1-3 hours long. Students get hands-on lessons and learn firsthand the importance of our natural resources and ways conservation practices can be done, even at their age.

Girl Scout Sessions (Douglas SWCD)

Douglas SWCD staff have been guest presenters at various girl scouts/Scouts of America sessions talking about the importance of our carbon and water footprints and aquatic invasive species prevention and how they can make a difference with promoting the state law.

Eagle and Boy Scout Assistance (Douglas SWCD)

Douglas SWCD has been involved with the Boy Scout Troops in Douglas and Pope counties for outdoor field days. Staff has planned and led field days at the local state and county parks. The topics are based on natural resource like merit badges they can earn. Topics of involvement and badges obtained are: 1 Mile Hike, 2 Mile Hike, First Aid, Outdoor Survival, Aquatic Invasive Species, Forestry, Renewable Energies, Giving back to the land. Each field day is set up to last 4-6 hours to ensure the scouts can get as much out of the day and as many merit badges as possible. On average there are 15-20 students that have attended each field day held.

CURRENT PARTNER K-12 EDUCATIONAL PROGRAMMING

SCHOOL EVENTS

Teacher Education (Grant SWCD)

Coffee and Corduroy with West Central School -The district attends a monthly meeting with the West Central Area Schools Ag. Teacher. He goes over what he is teaching his FFA students and we aided when applicable. We are currently assisting the Ag. Program with acquiring funds for a greenhouse.

West Central School Material Funding (Grant SWCD)

This district has been providing funding for new equipment such as soil/water quality probes. We are encouraging hands on learning with students at West Central School. We have been providing funds for the last few years.

Field Events (ALL)

These are current events organized by Soil and Water Conservation Districts for 4-6th grade students. The events are multi-station with a conservation focus typically held outdoors. Examples include: Water Festivals, Conservation Days, Groundwater Festival, etc.

Envirothon-(ALL)

The Envirothon is an outdoor environmental learning competition for high school students. Area competitions are administered by the state's Soil and Water Conservation Districts, in partnership with conservation organizations, educators, and other natural resource agencies.

The Envirothon promotes a desire for students to learn more about Minnesota's natural resources, as well as public policy and roles of government and landowners in managing the state's resources. The program helps students develop critical thinking skills, cooperative problem-solving skills, and decision-making skills.

Schools and teachers benefit by providing a learning opportunity to students who excel in the sciences and ecology. The community and state benefit by having concerned and well-informed citizens who can make good decisions about the environment.

Teams of students compete by visiting five learning stations and taking a 20-point exam on an environmental topic. The topics are:

- Aquatics
- Forestry
- Soils
- Wildlife
- Current events (which is a new topic each year)

The exams are administered by a local natural resource professional, who also gives the students a brief overview of the topic and explains some of the core concepts. Teams also prepare and give an oral presentation on the current events topic.

Teams compete at an Area Envirothon, and the top 3 teams from each area advance to the State Envirothon.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

GENERAL

County Fairs (ALL)

County Fairs are held in every part of the watershed and project partners participate by having a booth with program information each summer. Staff are available to discuss projects and programs available to landowners.

Tours (ALL)

One of the best ways for SWCD's to showcase projects and practices that they have worked on is by hosting a tour. The tours are generally open to the public and can also include elected officials. There may be a theme for a certain tour, such as prairie ecosystems, Aquatic Invasive Species, conservation best management practices, rain gardens, or a combination of topics. This is a great way for the public to see first-hand what some of these things look like on the ground. Feedback is always positive from these events and attendees always seem to learn something new. (Conservation Tour, Big Ole Sup-athon, Prairie Tour)

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

CLINICS AND WORKSHOPS

Community/KMRS/KKOK Expo (Pope SWCD, Stevens SWCD)

Stevens SWCD sets up an education/promotion booth each year at the community spring expo, to promote the District services for the County. They provide information on conservation on the land through, tree planting, native grass planting, rain garden planning and installation, conservation planning, rain barrels, tree products and sales. Over 1200 people attend to learn about various services and agencies in our community.

The Pope County Community Expo is an annual event of the Glenwood Lakes Area Chamber of Commerce at the Minnewaska Area High School. Pope SWCD and Pope County Land & Resource Management have informational booths and it is a good opportunity to interact with area residents of all ages. The expo has educational workshops, presentations, kids' and family activities,

entertainment, food, and a chance to visit with local businesses, agencies and nonprofit groups.

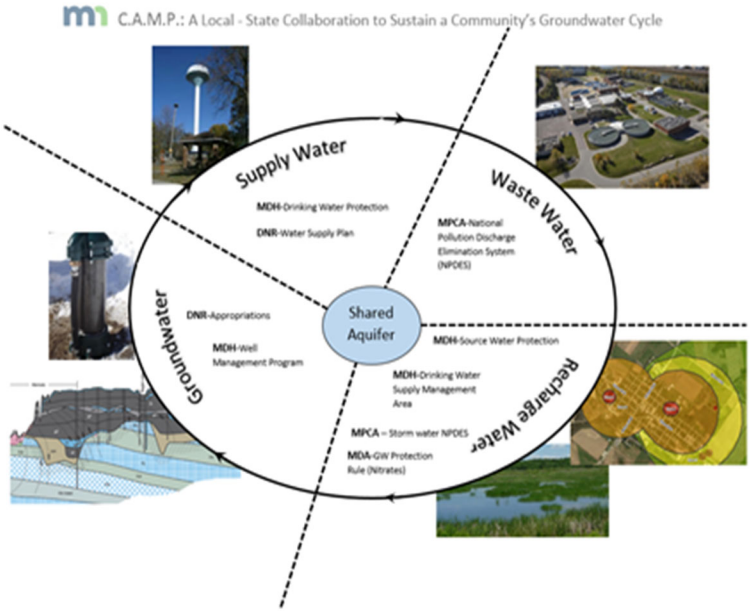
Nitrate Testing Clinic (ALL)

Partners host Nitrate Testing Clinics across the watershed. These clinics are for homeowners that can bring in drinking water samples to be tested on the spot for Nitrates.

They are then provided information and resources on next steps to address high nitrates in their drinking water. These clinics are for private well owners.

CAMP (Swift SWCD)

The Community-based Aquifer Management Partnership (CAMP) is a civic engagement effort designed to explore and define a community's unique groundwater story. The DNR is working with communities in southern Minnesota that are interested in knowing more about their aquifers. Land use decisions are water use decisions and aquifers may have many users. Knowing the full groundwater story can help citizens and communities align future goals to reduce use, risks and costs associated with the entire water system - from groundwater, to supply, to waste and recharge.



Tree Open House (ALL)

A Tree open house is an event in which SWCD's open their doors and invite the public in to answer any tree related questions for the upcoming planting season. SWCD staff assist landowners with the design and selection of trees for their tree planting. Refreshments are often provided.

SWCD staff work one on one with landowners to meet their goals and to select trees and shrubs that are best suited to their site.

Landowners can plant their own or hire SWCD staff to custom install their project.

Wetland Conservation Act Workshop (Kandiyohi SWCD)

The Kandiyohi SWCD and the County will be having a Wetland Conservation Workshop for Relators and Township officials and contractors on March 26th, 2020 at Prairie Woods Environmental Learning Center. We will be discussing the Contractor Notification Form the Joint Application form, Restoration Orders, Ag. Banking and BWSR State Banking.

Hort Night at the WCROC (Stevens SWCD)

Stevens SWCD sets up an education display at the WCROC horticulture Night in July each year to promote SWCD services such as, tree planting, native grass planting and rain gardens. Over 1000 people attend to see the gardens and learn about horticulture and agricultural practices.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

ORGANIZATIONAL OUTREACH

Wildlife Groups (ALL)

Partners attend meetings and banquets for wildlife groups including Ducks Unlimited, Pheasants Forever, Pope County Pheasant Restoration Committee, National Wild Turkey Federation, Sportsman's groups and more. Information is shared on programs and opportunities for landowners to implement conservation practices that meet the goals for these landowners and habitat restoration for these wildlife groups. Many of these partners set up displays or booths to share this information and often give presentations, share articles in their newsletter publications, and work on projects together.

Stewardship Week (Pope SWCD)

The Pope SWCD uses the National Association of Conservation Districts educational materials and distributes a letter with information on the theme for the year to approximately 30 area churches. The theme rotates each year. The information on the NACD website includes literagy templates to celebrate the annual conservation theme.

Print Media (ALL)

Newspaper Articles, Weekly, monthly or quarterly newspaper articles with conservation "tidbits" or program and cost share sign-up information with local contact information. County and SWCD educational events are also advertised through local newspaper articles.

Newsletters (ALL)

Newsletters are a great way of providing periodic updates to landowners. SWCD's use newsletters to promote relevant programs in their respected areas. Newsletters also contain informational and educational items on various conservation-related topics.

Facebook Page (Kandiyohi SWCD, Pope SWCD, Douglas SWCD, Swift SWCD, Stevens SWCD, West Otter Tail SWCD)

Social media including Facebook is used by SWCDs to share program information.

Annual Report (ALL)

The annual report summarizes SWCD and partnering agency projects and program highlights from the previous year including current and future programs and services along with educational articles, outreach events, event summaries, and before and after project completion photos. Available programs and cost share are advertised along with updates from partnering agencies. A conservationist of the year for each district is typically featured in the annual report, along with a bio of the landowner and/or their family along with photos and descriptions of their conservation work.

Public Service Announcements (Chippewa County, Steven SWCD)

Two public service announcements (30 and 60 seconds) are run daily all year long. Announcements vary in topics such as conservation practice cost share, household hazardous waste, burn barrels, proper pharmaceutical waste, loans, and any special events that come up throughout the year such as women's field day event, problem materials collection, workshops, and county fair.

WB UofM Extension (Kandiyohi SWCD)

This past late summer we worked with the U of M Extension and produced a video about building site windbreaks around poultry facilities in the County working with Jenni O and the Gorans Family and the Prinsburg Co-op. The video describes all the advantages that they provide to this Agriculture Business Production. The video is on our local WRAC TV and it's on you tube, The Kandiyohi SWCD is also playing it at their Soil Health Day and at other events throughout the year.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

URBAN

Stormwater Workshop (Pope SWCD)

The Pope SWCD held a Stormwater Workshop in the City of Glenwood to work with landowners on raingarden implementation.

The Pope SWCD has been working with landowners and the City of Glenwood on Stormwater flooding and water quality impacts to Lake Minnewaska. This lake is directly affected by the city's stormwater.

Raingarden Clinic (Grant SWCD, Kandiyohi SWCD, Stevens SWCD)

SWCDs hold clinics to share information and interest in implementing raingardens. Field visits include going to some raingardens throughout the target city and ending at the SWCD offices. The field tours highlight new raingardens that were recently built.

SWCDs also host shoreline workshops to showcase work completed. They look at potential project's along with doing some hands-on plan development and review of some older projects. Information shared include vegetation management and slope protection using rock rip rap and how to blend the two Best Management Practices (BMPs) together.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

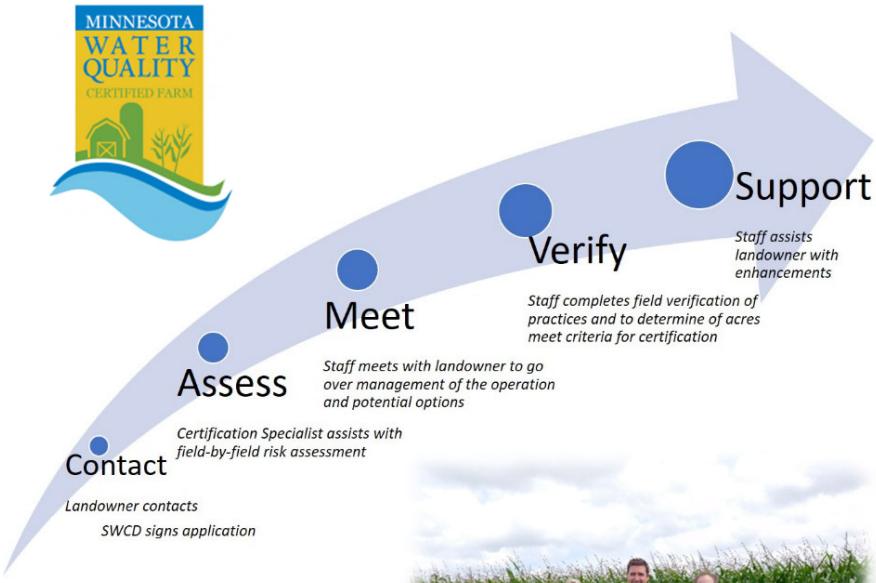
AGRICULTURAL

Women's Field Day (Chippewa SWCD)

Women's Field Day is an event geared towards women and women landowners. The event has a different theme every year and typically involves a tour and/or presentation of a conservation topic such as pollinators, renewable energy, soil health, and other conservation information along with door prizes and a meal.

Minnesota Agriculture Water Quality Certification Public Meetings (ALL)

SWCD staff along with Grant Pearson (Stearns SWCD MAWQCP Certification Specialist) and Minnesota Department of Agriculture have hosted a Minnesota Agriculture Water Quality Certification Program (MAWQCP) Public meeting for landowners, producers and farmers. The landowners come into the office and ask questions about the program and talk with landowners that have signed up already. MAWQCP is a voluntary opportunity for farmers and agricultural landowners to take the lead in implementing conservation practices that protect our water. Those who implement and maintain approved best farm management practices will be certified and in turn obtain regulatory certainty for a period of ten years. This public meeting is a great way to network, learn what others are doing on their land, and try to get more interest in the programs.



Irrigator Association Annual meeting (Pope SWCD)

The Irrigators Association of Minnesota holds an annual meeting in Freeport each year with speakers and booths. The Pope SWCD has presented at this event in the past and has had a booth to share program information applicable to irrigators.

Irrigation Clinic (Pope SWCD, Douglas SWCD, Kandiyohi SWCD, Swift SWCD)

The Pope, Stearns, Swift, Douglas and Kandiyohi SWCDs partner annually to hold an all-day Irrigation Clinic. The clinic is sponsored by local businesses. A committee of the staff from each SWCD comes up with the agenda topics. Landowners pay a small fee for the meal and the remaining costs are covered by sponsors. The location of the clinic rotates between the participating SWCDs. The Minnesota Department of Agriculture supports this event through the research funding and work at the Rosholt Research Farm.

Conservation Reserve Program Establishment Workshop (Swift SWCD, Chippewa SWCD)

This workshop covers the basics of establishing your Conservation Reserve Program (CRP) planting and helps address any lingering questions you may have regarding the establishment process.

Presentations cover Best Management Practices for establishment and management of your Conservation Reserve Program acres. SWCD, NRCS, and FSA staff are available for questions and provide information on program requirements.

Vendors are invited to attend and set up a booth and to share product and service information.

This is an event to help any landowner that is considering enrollment in this program or a refresher on how to manage the property including mid-contract maintenance.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

SOIL HEALTH

Soil Health Demonstration Plot (Grant SWCD) & Soil Health Field Day (Grant SWCD, Kandiyohi SWCD)

The Grant SWCD assists with a biennial cover crop and soil health fall field day at a local farmers test field in the eastern portion of the county. The field consist of 10 plots each 1 acre in size, of which 6 plots are no-till/cover crop & the remining 4 are managed with conventional tillage. The objective of the field day and plots is to show other local producers that no-till and cover crops are a viable and realistic option in the region. The 10-year goal of the Grant SWCD is to provide another soil health demonstration plot and field day in the western portion of the county.

Soil Health Conference Grants (Grant SWCD)

The Grant SWCD provides travel grants for staff and producers to attend soil health related conferences. These grants cover registration, food, and lodging and are available for producers throughout Grant County. Primarily, these grants have gone to individuals that have wanted to attend either a University of Minnesota or North Dakota State University sponsored event.

Cover Crop Field Day (Douglas SWCD)

Douglas SWCD staff partnered with local farmers in the Chippewa Watershed that have planted cover crops and done other soil health best management practices to hold a Cover Crop Field Day. This event was held at a local farm. Soil core samples of healthy soil was reviewed and used to explain how cover crops have impacted that farm's lifestyle. Visitors were able to see firsthand the short- and long-term impact of cover crops and benefits of soil health best management practices.

Life in the Pits Field Day (Swift SWCD)

The field day shows how attendees can take a shovel to any part of their field and have a better understanding of what they are seeing for soil health. While farmers used to depend on the physical characteristics of crops and presence of weeds to gauge the state of their soil, more are looking below ground as the focus on soil health grows. The field day will help farmers connect what they are seeing below ground with the results above ground. The field day features four pits with soil health experts present at each. The farmers will travel in small groups from pit to pit, learning about a different characteristic at each stop, including structural, physical and biological insights. Farmers will be able to take that knowledge and track their own soil health to determine if a certain practice is helping promote soil health on their farm.

Soil Health Chat (Douglas SWCD, Swift SWCD)

Douglas SWCD hosted informal and informational soil health discussions led by local farmers and area professionals. These Soil Health Chats were free to attend, and locally hosted to provide area farmers and producers with an opportunity to connect with others currently using soil health practices like cover crops, strip/no-till and more. This event was held in three different locations, Brandon, Starbuck, and Benson.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

LAKES

AIS Family Fun Event (Stevens SWCD)

Stevens SWCD started sponsoring a picnic at the Pomme de Terre Lake where families can come a learning about AIS prevention and have a fun night with their families. It has been growing in popularity the last couple of years. We set up games for the kids, have a picnic supper and share education and learning about AIS prevention for adults and kids.

Starry Stonewart Trek (Douglas County)

Douglas SWCD staff and the Land and Resources Management staff have hosted an annual Starry Stonewort Trek every year. This event is a statewide event focused on searching for one of Minnesota's newest aquatic invasive species. Starry Trek is designed to help others learn what Starry Stonewort is (and other invasives) and how to identify it. Volunteers and staff meet at a local training site, sit through a short crash course (brief training) on how to identify these invasives, and what protocols to follow if it should be found in the local water bodies. Groups of people are sent to various lakes that have been hand-picked from the Minnesota Aquatic Invasive Species Research Center (MAISRC) to sample and bring back anything that looks or seems like a suspicious aquatic invasive species. This is a free event and no experience or special equipment is required.

Shoreline Demonstration (Kandiyohi SWCD)

This event is targeted to lakeshore owners and local officials to demonstrate shoreline restorations and naturalization of shorelines. Some components of this event showed the removal of failing vertical wall and use of native vegetation as well as rock rip rap and erosion control blanket. The SWCD pointed out long term benefits of this restoration and through erosion control, reduced water runoff, and sediment and nutrient reduction. All the completed projects that were reviewed will give back to the community clean water, improved fish and wildlife habitat and beautiful landscapes.

This event is also planned for contractors.

Lake Association Meetings (Pope SWCD, Grant SWCD, Douglas SWCD)

Staff from the SWCDs attend and present at annual lake association meetings. This provides an opportunity for staff to share upcoming events or projects within the region as well as provide an avenue for lake residents to ask questions about the state of water.

Often these meetings are by request from the Lake Association members.

CURRENT PARTNER COMMUNITY EDUCATIONAL PROGRAMMING

POLITICAL

Public Entity Meetings and Events (ALL)

Annually the Minnesota Association of Soil and Water Conservation Districts holds a Legislative Days conference at the Capitol. SWCDs from the Chippewa River watershed participate in this event to lobby legislators for funding and programming that will benefit the environment and the natural resources in the watershed.

Partners meet with Township Officers, County Commissioners, and City Commissioners where applicable to meet the goals and objectives of their organizations. SWCDs meet at least annually with their County Commissioners to discuss budgets, annually planning, and project implementation goals in their areas. SWCD staff attend City Council Meetings to address resource concerns identified in the water plan. An example is the project for the City of Glenwood to address stormwater runoff and flooding which also has water quality impacts for Lake Minnewaska. (Pope SWCD)

Chippewa River Watershed Restoration and Protection Strategies

CHIPPEWA RIVER WATERSHED ASSOCIATION COMMUNITY EDUCATION

Chippewa River Watershed Association community education will be uniform across the watershed. The Chippewa River Watershed Association will lead programs including an annual meeting, canoe paddle event, pollinators, pies, and pints events, advisory groups, social media, and website. The intent is to not duplicate efforts at the County level but rather enhance and tell a watershed story on the state of our waters and efforts to protect or restore them. The CRWA will partner with local offices on existing local educational efforts and will lead these larger types of events. In the event there are no staff the partnership will discuss and select a partner to lead these efforts to further the mission of the members. Furthermore, the goal would be to prepare the partnership for a One Watershed One Plan in 2021. Priority should be given to completing actions that will further prepare the group for this effort.

A budget will be set, and activities will be prioritized for the partnership.

ANNUAL MEETING

The Chippewa River Watershed Association plans to hold one annual meeting centrally located in the watershed. The meeting will be held to share monitoring data and plans for the watershed implementation strategy. The meeting will also include updates from partners, field events scheduled, and best management practices implemented. The meeting will feature a main speaker as determined by the partners.

POLLINATORS, PIES, AND PINTS EVENT

To hold at least two events annually in different parts of the watershed focusing on local conservation issues in partnership in a relaxed setting held at a small business featuring locally grown products. These events should be focused according to the Prioritization Plan identified by the partnership where public awareness will be key in furthering the goal toward more implementation activities.

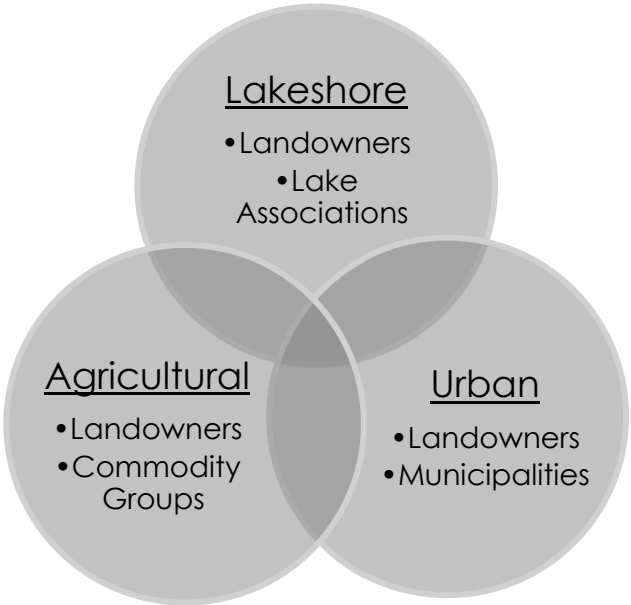
CANOE PADDLE EVENT

A Canoe and Paddle Event will be held in strategic parts of the watershed. One in the upper part of the watershed and one in the southern part of the watershed. The goal of the event would be to get people out recreating in the watershed and create a personal connection. It would also be helpful to identify areas in the prioritization process and target those areas to create an awareness of the restoration effort needing to be accomplished to meet water quality goals identified in the WRAPS.

ADVISORY GROUPS

Bi-Annual meetings will be held with each of these groups. The meeting structure will include a listening session format. The meetings will gather input to provide feedback on issues and concerns. The local partners will provide input during this process.

This task aims to consider specific stakeholder groups' perspectives and through engagement keep key watershed citizen sector informed of watershed approach findings and work to build coalitions that can collaboratively develop and realize solutions to obstacles of BMP adoption.



OVERALL HOW TO TELL THE STORY OF WRAPS

The partnership discussed how we would be able to best share information across the watershed to both the public and to the partnership members. The group agreed that this is a strategic time while the group is reorganizing to establish ways of communicating information for the partners and public. The group also discussed that these items would be important first steps made to prepare the group for a One Watershed One Plan application in 2021.

Priority was identified by the partnership for the following items: shared information storage, Story Map, website, social media, and tracking progress of projects, practices, educational program, and events.

Shared Information Storage

A SharePoint or Shared Website for the partnership will be created to be a repository for all documentation related to the CRWA. The Chippewa River Watershed Association or partner agency completing duties for the group will maintain and provide access to all partners. This site will be the main location for minutes, agendas, events, reports, project tracking, and any other information important to the partnership. The partners have identified this action as the highest priority for preparing the group for the One Watershed One Plan process in 2021.

Story Map

Combine maps with narrative text, images, and multimedia content to create a compelling, user-friendly web-based multimedia experience to engage the Chippewa Watershed Community.

The CRWA partners have agreed that a Story Map should be created and linked to a website for the organization. This information will tie to local implementation efforts with monitoring and resource information available to tell the story of the watershed water quality.

Website

A website will be created for the partnership that will include general characterization of the watershed in a format easy to understand. Links to all the partners will be included as well as all monitoring data and reports available. The CRWA partners have agreed that a new website for the reorganized group will be a priority.

Social Media

A Facebook page exists for the organization and the CRWA will update and provide information on implementation activities happening in the watershed. The group will

explore other social media platforms that will work well to inform landowners in the watershed about programs and activities.

Project, Program, Educational Tracking

The partnership has discussed and agreed that with the timing of this reorganization a tool should be set up to help track progress toward goals. This tool should be able to track projects, educational events held, and other information determined through a policy established by the group. This will be helpful as the partnership enters into a One Watershed One Plan. This tool will aid the group in reporting outcomes and outputs as well as progress made across the watershed.

The group will explore options available to the group and will decide and determine a budget to complete this activity.

Data Gaps

As of this writing this report the Covid-19 crisis has delayed MPCA sampling that was to have been already completed. The MPCA has informed the Chippewa River Watershed Partners that biological monitoring that was to have occurred in 2020 will likely be completed in 2021.

Chippewa River staff or partners will work closely with the MPCA as Cycle 2 monitoring and assessment results become available and the Stressor Identification process starts. As this information becomes available it will be used to identify gaps in knowledge for multiple efforts including the Stressor Identification process, new TMDL efforts, BMP feasibility discussions and suggest needed problem investigation efforts.

Once these gaps in knowledge have been identified Chippewa River staff or partners will work with MPCA staff and local partners to jointly prioritize these information needs. When priorities are clearly understood a plan to direct and spend dedicated funds will be cooperatively developed. Activities may include but are not limited to targeted water quality sampling, lake core samples, staff time to take samples, lake feasibility studies, ditch surveys and river channel surveys.

Chippewa River Watershed Restoration and Protection Strategies

Prioritization Exercise Completed by the Partnership












The Chippewa River Watershed Technical Advisory Committee members met by County group in August of 2020 to discuss by sub watershed and resource their area of concerns. The outcomes of these 8 separate discussions are described in detail in the chart below. These are also ranked by priority in the second column. These ranks reflect the local perspectives based on the ability to implement practices readily, recreational importance, and other factors. The group has included this information to give the full perspective of the discussions that were held around the entire watershed. The information captured will be helpful but most importantly these conversations will be a springboard into the One Watershed One Plan process which will be a more comprehensive prioritization exercise. A map of the Chippewa River Sub Watersheds can be found following this prioritization table.

County	**Priority Rank & Description**
Chippewa	1. Shakopee Creek a. **Specific Resource Identified:** Shakopee Sub Watershed i. **Explanation of Prioritization:** 1. Turbidity Impairment 2. Bacteria Impairment 3. Aquatic Life Impairment 4. Excess Nutrients Impairment ii. **Specific Practice:** Feedlot iii. **Data Gap:** 1. Problem Investigation 2. Lakeshed Report 2. Shakopee Creek a. **Specific Resource Identified:** Dry Weather Creek i. **Explanation of Prioritization:** 1. E-Coli and Chlorpyrifos impairments ii. **Specific Practice:** Feedlot iii. **Data Gap:** 1. Problem Investigation 2. Lakeshed Report

Douglas

1. Upper Mainstem

a. **Specific Resource Identified:** Upper Chippewa

i. Explanation of Prioritization:

1. Downstream impaired lakes including impaired Long Lake

ii. Specific Practice:

1. Ag Waste
2. Feedlot
3. Nutrient Management
4. Erosion and Sediment Control

iii. Data Gap:

1. Problem Investigation
2. In Stream Survey
3. Phosphorus Budget
4. BATHTUB Model

2. Upper Mainstem

a. **Specific Resource Identified:** Stowe Lake

Stowe Lake is considered a nearly/barely lake and drains to the impaired Long Lake

i. **Explanation of Prioritization:**

1. Excess nutrient impairment
2. Downstream reach impaired for Total Suspended Solids
3. Nearly/Barely Lake

ii. **Specific Practice:**

1. Erosion and Sediment Control
2. Feedlot

iii. Data Gap:

1. Problem Investigation
2. Lakeshed Report
3. Phosphorus Budget

4. BATHTUB Model

b. **Specific Resource Identified:** Long Lake

i. **Explanation of Prioritization:** Excess Nutrient Impairment

ii. **Specific Practice:** Erosion and Sediment Control

iii. **Data Gap:**

1. Problem Investigation
2. Lakeshed Report

3. East Branch

a. **Specific Resource Identified:** Lake Leven

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Nearly/Barely Lake

ii. **Specific Practice:** None identified

iii. **Data Gap:**

1. Problem Investigation
2. Lakeshed Report
3. Phosphorus Budget
4. BATHTUB Model

Grant

1. Upper Mainstem

a. **Specific Resource Identified:** Thompson Lake

i. **Explanation of Prioritization:** Excess Nutrient Impairment

ii. **Specific Practice:** None Identified

iii. **Data Gap:**

1. Data Assessment

2. Upper Mainstem

a. **Specific Resource Identified:** Lower Elk Sub Watershed

i. **Explanation of Prioritization:**

1. Bacteria Impairment

2. Turbidity Impairment
3. Aquatic Life Impairment

ii. **Specific Practice:** None Identified

iii. **Data Gap:** None Identified

3. Upper Mainstem

a. **Specific Resource Identified:** Chippewa Mainstem

i. **Explanation of Prioritization:**

1. E-Coli Impairment
2. Turbidity Impairment
3. Invertebrate Bioassessment Impairment

ii. **Specific Practice:** None identified

iii. **Data Gap:** More information needed to address bioassessments

Kandiyohi

1. Shakopee Creek

b. **Specific Resource Identified:** CD27

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Bacteria Impairment
3. Lake Norway is a Nearly/Barely lake that this drainage system impacts

i. **Specific Practice:** Sand Lake Restoration

ii. **Data Gap:** None Identified

2. Shakopee Creek

a. Specific Resource Identified: CD29

i. **Explanation of Prioritization:** Excessive Nutrients

ii. **Specific Practice:** None identified

iii. **Data Gap:** None identified

3. Shakopee Creek

a. **Specific Resource Identified:** Norway Lake

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Nearly/Barely Lake

ii. Specific Practice:

1. Upstream Lake Restoration
2. Erosion and Sediment Control

iii. **Data Gap:** none identified

4. Shakopee Creek

a. **Specific Resource Identified:** Upper Shakopee

i. **Explanation of Prioritization:** This sub watershed includes CD27, CD29, and Norway lake which are all high priorities for this County. The Shakopee headwaters chain of lakes includes Norway, Games, Swan, Middle, Henschien, and Andrew Lakes with the focal of Sibley State Park as a valued recreational and economic resource in this region.

ii. Specific Practice:

1. Lake restoration
2. Erosion and Sediment Control

iii. **Data Gap:** None Identified

b. **Specific Resource identified:** Huse Creek

i. **Explanation of Prioritization:** E-coli Impairment

ii. **Specific Practice:** None Identified

iii. **Data Gap:** The source of the e-coli is not known, there has been a lot of septic system updates in this area already.

Otter Tail

1. Upper Mainstem

a. **Specific Resource Identified:** Block Lake

i. **Explanation of Prioritization:** Excess Nutrient Impairment

ii. **Specific Practice:** None Identified

iii. Data Gaps:

1. Problem investigation
2. Lakeshed Report

3. Phosphorus Budget
4. BATHTUB Model

2. Upper Mainstem

a. **Specific Resource Identified:** Ditch 61

i. **Explanation of Prioritization:** Feeds into Stowe Lake which is a nearly/barely designated lake.

ii. **Specific Practice:** None

iii. **Data Gaps:** Determination of contribution from ditch to Stowe Lake

Pope

1. Upper Mainstem

a. **Specific Resource Identified:** Pope County 8 Lake TMDL Study Area

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Lake Emily considered Nearly/Barely

ii. **Specific Practice:** Erosion and Sediment Control

iii. **Data Gaps:** None Identified

b. **Specific Resource Identified:** Lake Emily

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Nearly/Barely Lake

ii. **Specific Practice:** Erosion and Sediment Control

iii. **Data Gaps:**

1. Detailed Phosphorus Budget
2. Updated BATHTUB Model

2. East Branch

a. **Specific Resource identified**: Goose Lake

i. **Explanation of Prioritization:**

1. Protection
2. Nearly/Barely Lake

ii. **Specific practice:** Protection

iii. **Data Gaps:**

1. Problem Investigation
2. Lakeshed Report
3. Phosphorus Budget
4. BATHTUB Model

b. **Specific Resource Identified:** Lake Leven

i. **Explanation of Prioritization:**

1. Excess Nutrient Impairment
2. Nearly/Barely Lake

ii. **Specific Practice:** None Identified

iii. **Data Gap:**

1. Problem Investigation
2. Determine source of total phosphorus from phosphorus budget
3. BATHTUB Model

c. **Specific Resource Identified:** Pope County 8 Lake TMDL Study Area

i. **Explanation of Prioritization:** Excess Nutrients Impairment

ii. **Specific Practice:** Erosion and Sediment Control

iii. **Data Gap:** None Identified

Stevens

1. Upper Mainstem

a. **Specific Resource Identified:** Long Lake

b. **Explanation of Prioritization:**

i. Excess Nutrients Impairment

ii. This is a valued recreational lake.

c. **Specific Practice Identified:** None Identified

d. Data Gap:

i. Problem Investigation

ii. Lakeshed Report

iii. Phosphorus Budget

iv. BATHTUB Model

2. Upper Mainstem

a. **Specific Resource Identified:** Chippewa River

i. Explanation of Prioritization:

1. Bacteria Impairment
2. Aquatic Life Impairment
3. Excess Nutrients impairment

ii. **Specific Practice Identified:** Erosion and Sediment Control

iii. **Data Gap:** Field Scale Prioritization

3. Lower Mainstem

a. **Specific Resource Identified:** Judicial Ditch 9

i. **Explanation of Prioritization:** Invertebrate Bioassessment Impairment

ii. **Specific Practice Identified:**

1. Nutrient Management
2. Feedlots

iii. Data Gap:

1. Field Scale Prioritization

b. **Specific Resource Identified:** Page Lake

i. **Explanation of Prioritization:** Protection Status

ii. **Specific Practice Identified:** Protection

iii. **Data Gap:**

1. Phoshorus Budget
2. BATHTUB Model

Swift

1. Shakopee Creek

a. **Specific Resource Identified:** Shakopee Lake

i. **Explanation of Prioritization:** Excess Nutrients

ii. Specific Practice Identified:

1. Upland Erosion Control

2. In-Lake Management

iii. **Data Gap:**

1. Problem Investigation
2. Phosphorus Budget
3. BATHTUB Model

b. **Specific Resource Identified:** Shakopee Sub Watershed

i. **Explanation of Prioritization:**

1. Turbidity Impairment
2. Bacteria Impairment
3. Aquatic Life Impairment
4. Excess Nutrient Impairment

ii. **Specific Practice Identified:**

1. Upland Erosion Control
2. In-Lake Management

iii. **Data Gap:** None Identified

2. Lower Mainstem

a. **Specific Resource Identified:** Cottonwood Creek

i. **Explanation of Prioritization:**

1. E-Coli Impairment
2. Fish Bioassessment Impairment

ii. **Specific Practice Identified:** None Identified

iii. **Data Gap:** None identified

3. East Branch

a. **Specific Resource Identified:** East Branch of the Chippewa River

b. Explanation of Prioritization:

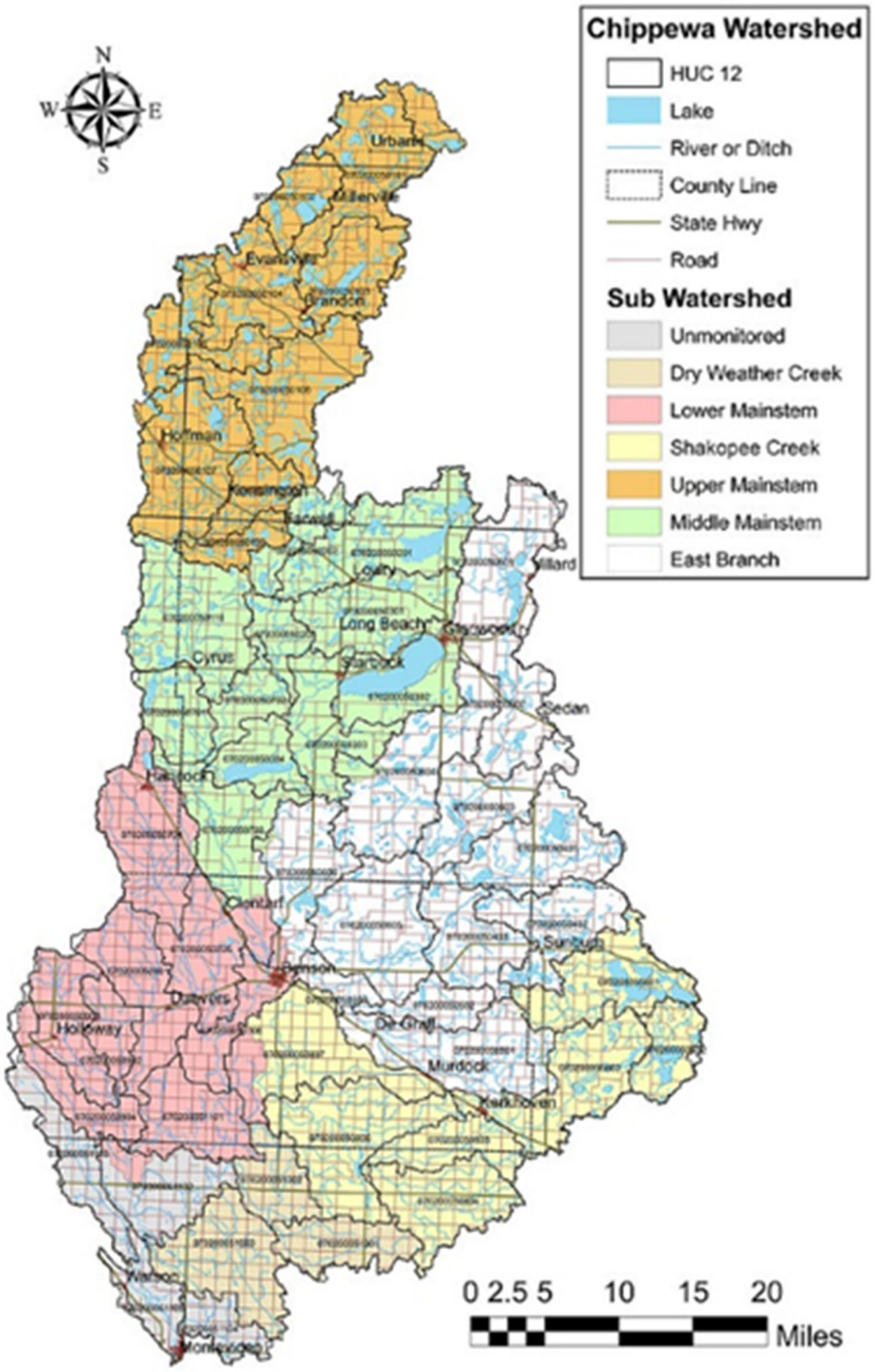
i. Turbidity Impairment

ii. E-Coli Impairment

c. **Specific Practice Identified:** None Identified

d. **Data Gap:** Problem Investigation

Chippewa River Watershed Sub Watershed Map



Summary of Prioritization Meetings

After meeting with most of the county and SWCD staff by county the Technical Advisory Committee came up with a list of ranked focus areas. What follows is the list of just the top ranked areas. Some of these priorities align well with the first WRAPS reports priority areas. They are:

- **Stowe Lake watershed** in the Upper Chippewa. Headwater, nearly barely lake that has an active and vocal lake association. Feedlots have been an issue and several bio-impairments are part of the issue. Impairments of the Chippewa River begin at the outlet of this lake. Stowe lake monitoring data is relatively new. Running bathtub and producing a lake report of some sort that could define the issues and provide some possible strategies for the lake and river would be a welcome effort that could then feed into local efforts.

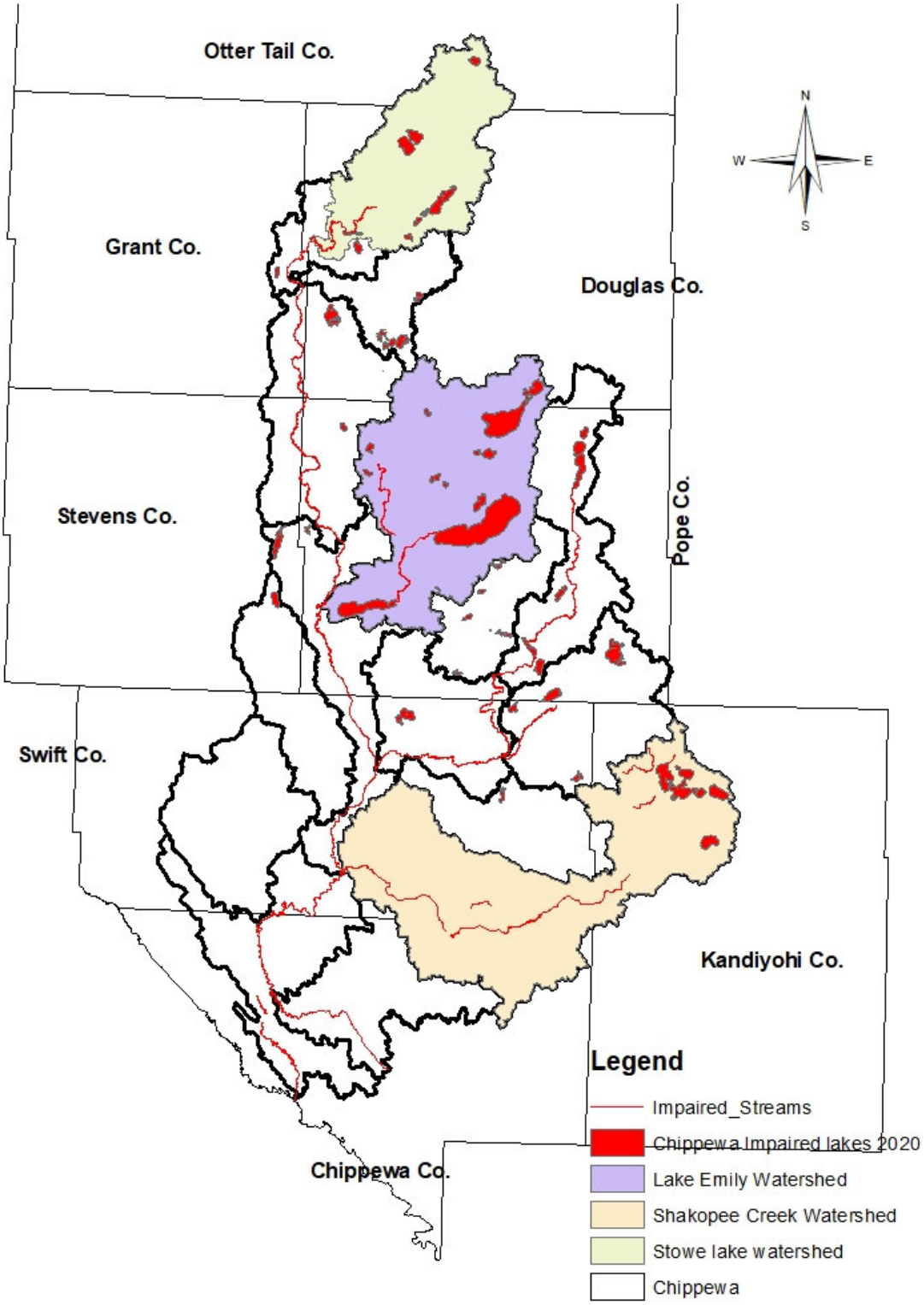
- **Lake Emily watershed** in Pope County. Lake Emily is a nearly barely lake and the end of a larger watershed that includes several impaired lakes from the Pope County 8 Lakes TMDL and other stream impairments. There has been much work done in this sub-watershed and the biounit has targeted Outlet Creek as a possibility for delisting. Tying a delisting as evidence of progress to the data on the nearly barely lake as motivation for further change could set the stage for a larger effort to come.

- **Shakopee Creek** and headwaters in Swift, Chippewa and Kandiyohi Counties. Shakopee Creek is full of new TALU impairments (Need to describe TALU more) and the soon to be documented impaired Shakopee lake have been the focus of the Watershed due to its disproportionate contributions of pollutants. The headwaters with Sibley State Park, its chain of lakes and the barely impaired Norway Lake have been the intense focus of both MPCA and DNR monitoring and modeling. Recent septic upgrade and feedlot work have been focused on CD29 (impaired for bacteria). The counties and SWCDs would like to build a common sense of understanding around this whole HUC 10, pulling together C2 monitoring data, developing models and strategies, and building public engagement and buy-in toward a common goal for the watershed.

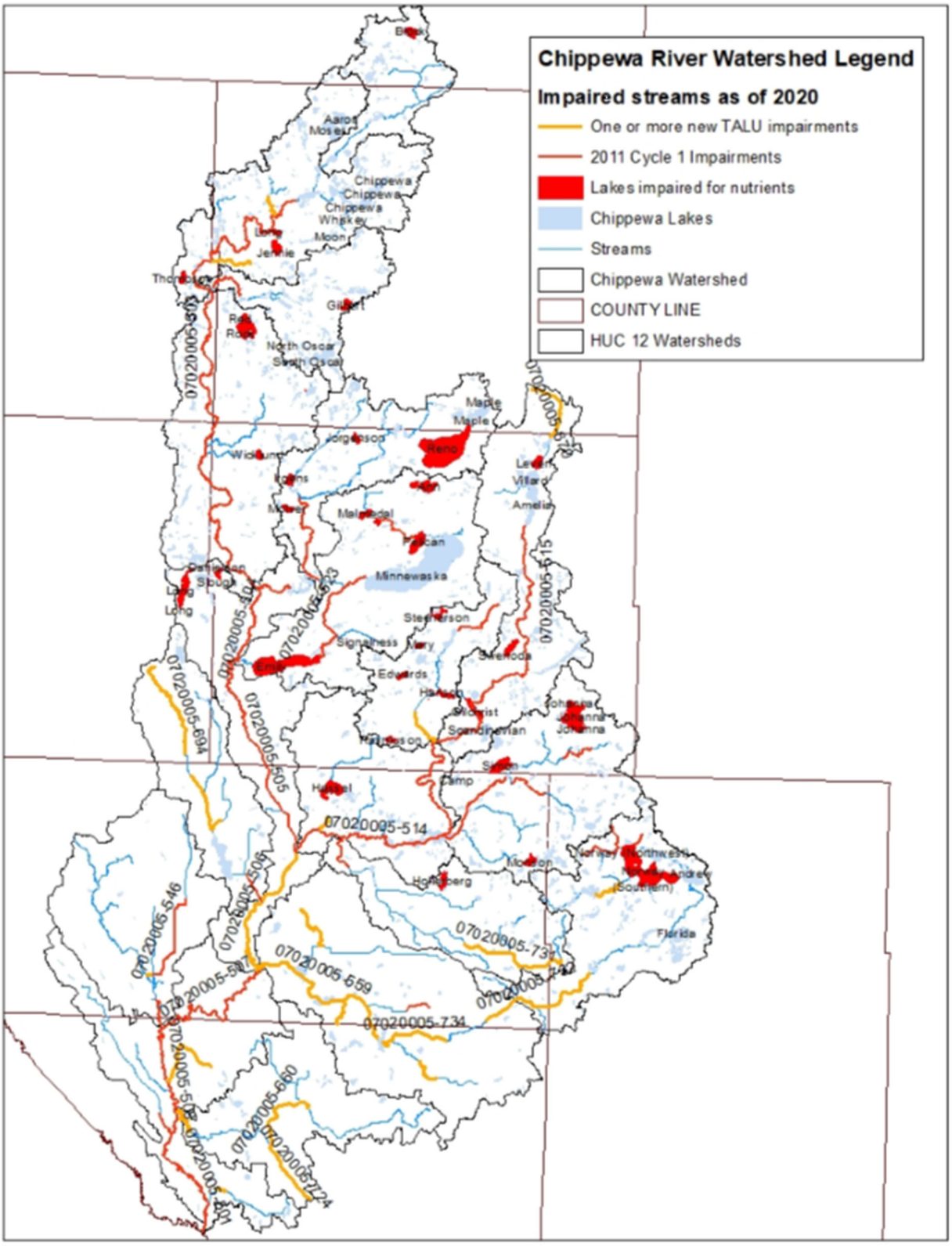
- **Smaller regional recreational lakes for protection and restoration** are the target of some of the less represented Chippewa watershed counties. These are Block Lake in Otter Tail County, Thompson Lake in Grant County, Long lake in Stevens County. These lakes are all impaired, but little is known about them. The partners involved would like to use PP funds to pull together the data and use it to reach out to the communities surrounding these lakes to build awareness and build trust and commitment toward fixing these lakes.

- **Watershed wide CE/PP** to maintain a sense of common resource and watershed community. The Technical Advisory Team would like to build a watershed wide outreach effort that combines outreach events and a common web-based connection (via story maps, share point resource library and a watershed wide shared calendar of events).

Top Ranked Priority Areas with Impairments



2020 Chippewa River Watershed Impairments



Chippewa River Watershed Impairments by County

County	Waterbody ID	Waterbody Name	Pollutant/Stressor/Impairment	First Listed	TMDL Status
Chippewa	07020005-501	Chippewa River	Fecal coliform	1994	TMDL Approved, 2007
			Turbidity	2002	TMDL Approved, 2020
	07020005-502	Chippewa River	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Fish bioassessments	2012	TMDL pending
	07020005-508	Chippewa River	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Fecal coliform	2008	TMDL Approved, 2007
			Turbidity	2006	TMDL Approved, 2014
	07020005-724	Dry Weather Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fish bioassessments	2020	TMDL pending
	07020005-726	Dry Weather Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Chlorpyrifos	2016	TMDL pending
			Fecal coliform	2006	TMDL Approved, 2007
			Total suspended solids (TSS)	2020	TMDL pending
	07020005-734	Shakopee Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Escherichia coli (E.coli)	2012	TMDL Approved, 2017
	07020005-593	Spring Creek (County Ditch 10A)	Fish bioassessments	2020	TMDL pending
	07020005-576	Unnamed creek	Fish bioassessments	2020	TMDL pending
	07020005-584	Unnamed creek	Benthic macroinvertebrates bioassessments	2012	TMDL Approved, 2017
			Dissolved oxygen	2012	TMDL Approved, 2017
			Escherichia coli (E.coli)	2014	TMDL Approved, 2017
	07020005-660	Unnamed creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fish bioassessments	2020	TMDL pending
	07020005-661	Unnamed creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
	07020005-549	Unnamed ditch	Benthic macroinvertebrates bioassessments	2020	TMDL pending
Douglas	21-0189-00	Gilbert Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	21-0323-00	Jennie Lake	Nutrients, Phosphorus	2008	TMDL Approved, 2017
	21-0343-00	Long Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	21-0291-00	Red Rock Lake	Nutrients, Phosphorus	2008	TMDL Approved, 2017
	07020005-901	Unnamed creek (Freeborn Lake Inlet)	Turbidity	2006	TMDL Approved, 2014
	07020005-541	Unnamed creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
	07020005-638	Unnamed creek	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Fish bioassessments	2012	TMDL pending
	07020005-666	Unnamed creek	Fish bioassessments	2020	TMDL pending
	07020005-670	Unnamed creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fish bioassessments	2020	TMDL pending
	21-0692-00	Unnamed PCA site #382	Aquatic plant bioassessments	2010	TMDL pending
			Benthic macroinvertebrates bioassessments	2010	TMDL pending
Grant	07020005-503	Chippewa River	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Fecal coliform	2006	TMDL Approved, 2007
			Turbidity	2006	TMDL Approved, 2014
	26-0020-00	Thompson Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
Kandiyohi	07020005-570	County Ditch 27	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fecal coliform	2006	TMDL Approved, 2007
			Fish bioassessments	2020	TMDL pending
	07020005-567	County Ditch 29	Fecal coliform	2006	TMDL Approved, 2007
	34-0208-00	Middle Lake	Nutrients, Phosphorus	2012	TMDL pending
	34-0251-01	Norway (Northwest) Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	34-0251-02	Norway (Southern) Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	07020005-917	Unnamed creek (Huse Creek)	Escherichia coli (E.coli)	2010	TMDL Approved, 2017
	07020005-566	Unnamed ditch (Judicial Ditch 29)	Fecal coliform	2006	TMDL Approved, 2007
Otter Tail	56-0079-00	Block Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
Pope	61-0122-00	Ann Lake	Nutrients, Phosphorus	2006	TMDL Approved, 2017
	07020005-504	Chippewa River	Turbidity	2010	TMDL Approved, 2014
	07020005-505	Chippewa River	Fecal coliform	2006	TMDL Approved, 2007
			Fish bioassessments	2006	TMDL pending
			Turbidity	2006	TMDL Approved, 2014
	07020005-515	Chippewa River, East Branch	Escherichia coli (E.coli)	2012	TMDL Approved, 2017
	07020005-580	County Ditch 15	Fish bioassessments	2020	TMDL pending
	61-0194-00	Danielson Slough Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0106-00	Edwards Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0180-00	Emily Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017

	61-0072-00	Gilchrist Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017
	61-0080-00	Hanson Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0211-00	Irgens Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0006-00	Johanna Lake	Nutrients, Phosphorus	2010	TMDL Approved, 2017
	61-0123-00	John Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0164-00	Jorgenson Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0066-00	Leven Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017
	07020005-713	Little Chippewa River	Escherichia coli (E.coli)	2010	TMDL Approved, 2017
			Fish bioassessments	2012	TMDL pending
			Turbidity	2010	TMDL Approved, 2014
	07020005-714	Little Chippewa River	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Fish bioassessments	2006	TMDL pending
	61-0162-00	Malmedal Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017
	61-0099-00	Mary Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0199-00	McIver Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	07020005-551	Mud Creek	Benthic macroinvertebrates bioassessments	2012	TMDL pending
	07020005-523	Outlet Creek	Benthic macroinvertebrates bioassessments	2012	TMDL Approved, 2017
			Escherichia coli (E.coli)	2012	TMDL Approved, 2017
			Fish bioassessments	2012	TMDL Approved, 2017
	61-0111-00	Pelican Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017
	61-0086-00	Rasmuson Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0078-00	Reno Lake	Nutrients, Phosphorus	2002	TMDL Approved, 2017
	61-0034-00	Simon Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	61-0095-00	Steenerson Lake	Nutrients, Phosphorus	2012	TMDL pending
	61-0128-00	Strandness Lake	Nutrients, Phosphorus	2006	TMDL Approved, 2017
	61-0051-00	Swenoda Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	07020005-628	Trapper Run Creek	Benthic macroinvertebrates bioassessments	2012	TMDL pending
			Escherichia coli (E.coli)	2014	TMDL Approved, 2017
			Fish bioassessments	2012	TMDL pending
	07020005-623	Unnamed creek	Fish bioassessments	2012	TMDL pending
	61-0522-00	Unnamed	Benthic macroinvertebrates bioassessments	2008	TMDL pending
	61-0204-00	Wicklund Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
Stevens	75-0024-00	Long Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	07020005-694	Unnamed creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
Swift	07020005-506	Chippewa River	Escherichia coli (E.coli)	2012	TMDL Approved, 2017
			Total suspended solids (TSS)	2020	TMDL pending
	07020005-507	Chippewa River	Benthic macroinvertebrates bioassessments	2012	TMDL Approved, 2017
			Turbidity	2012	TMDL Approved, 2017
	07020005-514	Chippewa River, East Branch	Fecal coliform	2006	TMDL Approved, 2007
			Turbidity	2006	TMDL Approved, 2014
	07020005-729	Cottonwood Creek	Escherichia coli (E.coli)	2014	TMDL Approved, 2017
	07020005-579	County Ditch 3	Escherichia coli (E.coli)	2014	TMDL Approved, 2017
	07020005-690	County Ditch 15	Fish bioassessments	2012	TMDL pending
	76-0086-00	Hassel Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	76-0057-00	Hollerberg Lake	Nutrients, Phosphorus	2010	TMDL Approved, 2017
	07020005-702	Judicial Ditch 5	Benthic macroinvertebrates bioassessments	2020	TMDL pending
	07020005-546	Judicial Ditch 8	Fish bioassessments	2004	TMDL pending
	07020005-585	Judicial Ditch 9	Fish bioassessments	2020	TMDL pending
	76-0033-00	Monson Lake	Nutrients, Phosphorus	2012	TMDL Approved, 2017
	07020005-518	Mud Creek	Escherichia coli (E.coli)	2014	TMDL Approved, 2017
	07020005-554	Mud Creek	Benthic macroinvertebrates bioassessments	2012	TMDL Approved, 2017
			Dissolved oxygen	2012	TMDL Approved, 2017
			Escherichia coli (E.coli)	2014	TMDL Approved, 2017
			Fish bioassessments	2012	TMDL Approved, 2017
	07020005-731	Mud Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
	07020005-559	Shakopee Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fecal coliform	2006	TMDL Approved, 2007
			Fish bioassessments	2006	TMDL pending
			Turbidity	2006	TMDL Approved, 2014
	07020005-732	Shakopee Creek	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Dissolved oxygen	2020	TMDL pending
			Escherichia coli (E.coli)	2012	TMDL Approved, 2017
	07020005-574	Unnamed creek	Turbidity	2006	TMDL Approved, 2014
	07020005-701	Unnamed creek	Fish bioassessments	2020	TMDL pending
	07020005-712	Unnamed creek	Fish bioassessments	2020	TMDL pending
	07020005-599	Unnamed ditch	Benthic macroinvertebrates bioassessments	2020	TMDL pending

	07020005-703	Unnamed ditch	Benthic macroinvertebrates bioassessments	2020	TMDL pending
	07020005-727	Unnamed diversion ditch	Benthic macroinvertebrates bioassessments	2020	TMDL pending
			Fish bioassessments	2020	TMDL pending

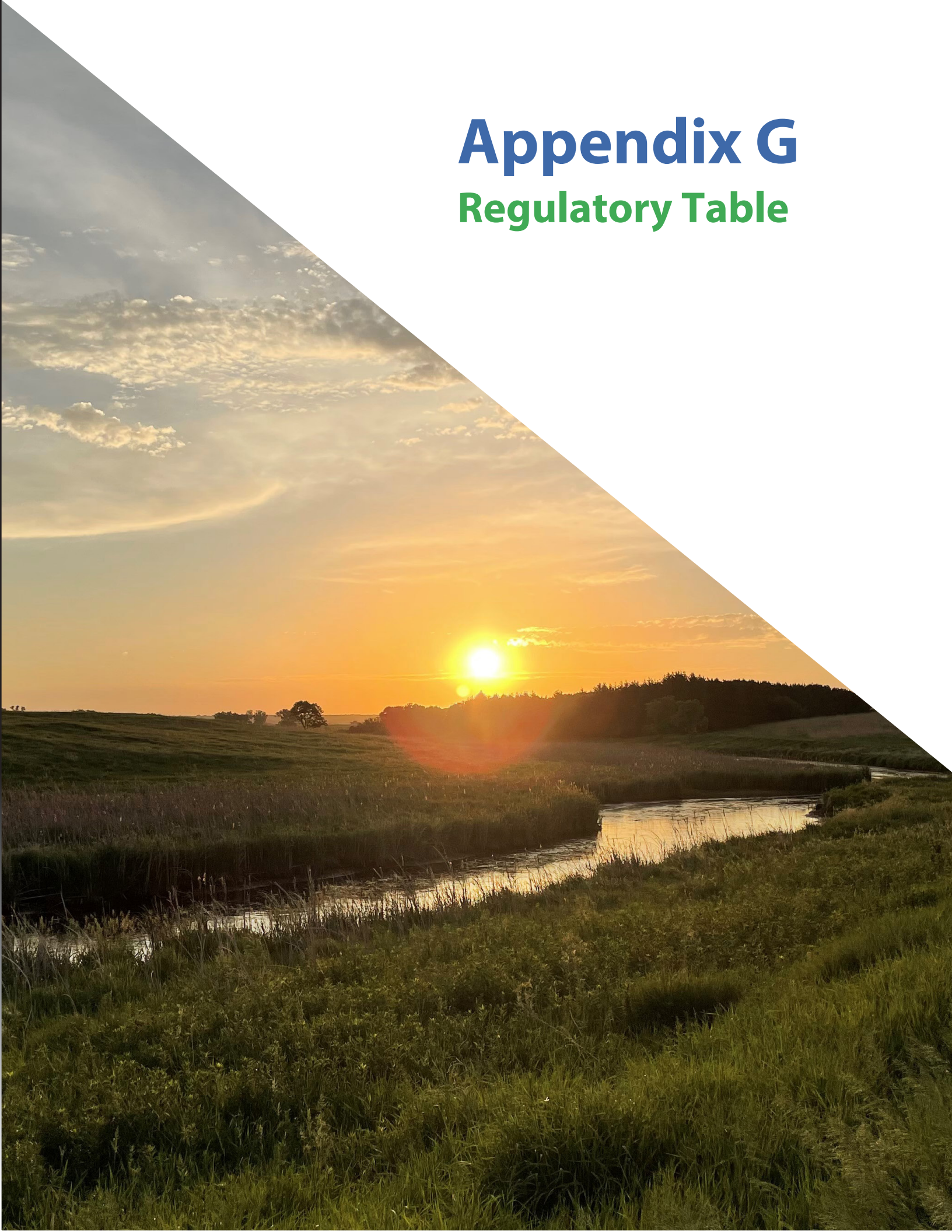
Showing data for: **Chippewa River watershed**

Total Maximum Daily Load (TMDL) approval status

The information below tracks the MPCA's efforts to develop TMDLs on all impaired waterbodies on the 2020 Impaired Waters List. TMDLs are approved by the U.S. Environmental Protection Agency and set pollutant reduction goals that help target implementation strategies and actions to restore impaired lakes, rivers, and streams.

Appendix G

Regulatory Table



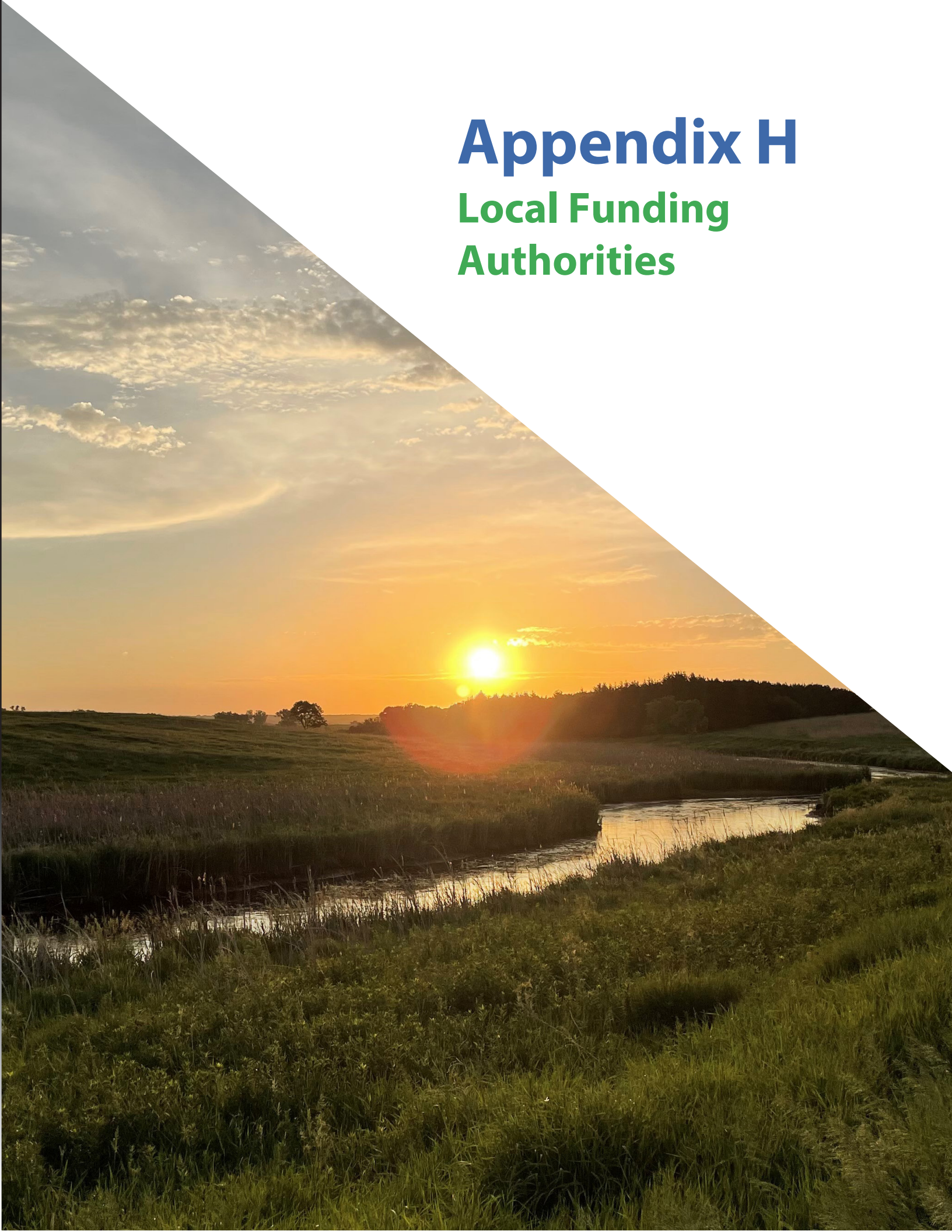
Chippewa River Comprehensive Watershed Management Plan

Regulatory Comparison Table

Many of the issues affecting priority issues can be addressed in part through administration of statutory responsibilities and ordinances. This document is intended to be used to summarize the existing local rules, ordinances and statutes that are currently being administered by planning entity, to understand areas of duplication, gaps, and opportunities.

Statute, Ordinance, or Rule Name	Chippewa	Douglas	Grant	Kandiyohi	Ottertail	Pope	Stevens	Swift
Shoreland Management	Ordinance	Ordinance	Ordinance	Shoreland Alteration Permits	Ordinance	Ordinance	Ordinance	Ordinance
Floodplain Management	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance
Subsurface Sewage Treatment System (SSTS)	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance
Solid Waste Management	Program	Partners with Pope County	Program	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance
Hazard Management	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan	Hazard Mitigation Plan

Statute, Ordinance, or Rule Name	Chippewa	Douglas	Grant	Kandiyohi	Ottertail	Pope	Stevens	Swift
Feedlots	Ordinance	Partnership with MPCA	Ordinance	Partnership with MPCA	Ordinance	Partnership with MPCA	Partnership with MPCA	Partnership with MPCA
Buffers	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance	Ordinance
Wetland Conservation Act	SWCD Administers	SWCD Administers	County Administers	County Administers	West Ottertail SWCD	SWCD Administers	County Administers	County Administers
Aquatic Invasive Species (AIS)	AIS Program	AIS Program	AIS Program	AIS Department	AIS Task Force	AIS Action Plan	AIS Program	AIS Program
Construction Erosion Control	-	Construction Erosion Regulations	Grant SWCD	Construction Erosion Regulations	-	Construction Erosion Regulations	-	-
Public Drainage Systems	Drainage Department	Inspection and Maintenance	Ordinance and inspection	Drainage Department	Inspection and maintenance	Inspection and maintenance	Inspection and maintenance	Inspection and maintenance



Appendix H

Local Funding Authorities

Local Funding Authorities

Purpose: *This table provides an overview of Minnesota statutes and laws that provide authorities to local governments to fund water management projects, to be used by local governments while exploring funding options for locally funded water projects. Does not include fees, fines, or wetland banking, grants, etc. This is not a legal document and should not be considered comprehensive, complete, or authoritative.*

note: "metro" refers to Anoka, Carver, Dakota, Hennepin, Ramsey, and Washington counties or watershed organizations in the 7-county metro area.

Citation	Applies to	Summary *(please see details in the full text of each provision)*
§40A.152	Counties (metro)	Money from the county conservation account (see chapter 287) must be spent by the county to reimburse the county and taxing jurisdictions within the county for revenue lost under the conservation tax credit under §273.119 or the valuation of agricultural preserves under §473H.10. Money remaining in the account after reimbursement may be spent on: 1) agricultural land preservation and conservation planning and implementation of official controls under this chapter or chapter 473H; 2) soil conservation activities and enforcement of soil loss ordinances; 3) incentives for landowners who create exclusive agricultural use zones; 4) payments to municipalities within the county for the purposes of clauses 1-3.
§103B.241	Watershed districts & watershed management organizations (metro)	May levy a tax to pay for plan preparation costs & projects in the adopted plan necessary to implement the Metropolitan Water Management Program.
§103B.245	Watershed districts & watershed management organizations (metro)	May establish a watershed management tax district within the watershed to pay the costs of: planning required under §§103B.231 and 103B.235, the capital costs of water management facilities described in the capital improvement program of the plans, and normal & routine maintenance of the facilities.
§103B.251	Watershed districts & watershed management organizations (metro), counties	May certify for payment by the county all or any part of the cost of a capital improvement contained in the capital improvement program of plans developed in accordance with §103B.231. Counties may issue general obligation bonds to pay all or part of the cost of project. The county may pay the principal and interest on the bonds by levying a tax on all property located in the watershed or subwatershed in which the bonds are issued. Loans from counties to watershed districts for the purposes of implementing this section are not subject to the loan limit set forth in §103D.335.

Citation	Applies to	Summary *(please see details in the full text of each provision)*
§103B.331 Subdivisions 3 & 4	Counties	(3) May charge users for services provided by the county necessary to implement the local water management plan.
		(4) May establish one or more special taxing districts within the county and issue bonds to finance capital improvements under the Comprehensive Local Water Management Act. After adoption of the resolution, a county may annually levy a tax on all taxable property in the district.
§103B.335	Counties, municipalities, or townships	May levy a tax to implement the Comprehensive Local Water Management Act or a comprehensive watershed management plan (§103B.3363). A county may levy amounts needed to pay the reasonable costs to SWCDs and WDs of administering and implementing priority programs identified in an approved & adopted plan or comprehensive watershed management plan.
§103B.555 Subdivisions 1 & 3	Counties	(1) May establish a Lake Improvement District and impose service charges on the users of lake improvement district services within the district. May levy an ad valorem tax solely on property within the lake improvement district for projects of special benefit to the district; may impose or issue any combination of service charges, special assessments, obligations, and taxes.
		(3) A tax under Subd. 1 may be in addition to amounts levied on all taxable property in the county for the same/similar purposes.
§103C.331 Subdivision 16	County boards on behalf of soil and water conservation districts	May levy an annual tax on all taxable real property in the district for the amount that the board determines is necessary to meet the requirements of the district.
§103D.335	Watershed districts	A watershed district has the power to incur debts, liabilities, and obligations and to provide for assessments and to issue certificates, warrants, and bonds.
§103D.601	Watershed districts	May set up special taxing districts via petition to conduct larger, Capital Improvement Projects (CIP). The costs to the affected parties cannot exceed $750,000.
§103D.615	Watershed districts	May declare an emergency and order that work be done without a contract. The cost of work undertaken without a contract may be assessed against benefitted properties or raised by an ad valorem tax levy if the cost is not more than 25% of the most recent administrative ad valorem levy and the work is found to be of common benefit to the watershed district.

Citation	Applies to	Summary *(please see details in the full text of each provision)*
§103D.729	Watershed districts	May establish a water management district or districts in the territory within the watershed to collect revenues and pay the costs of projects initiated under §§103B.231, 103D.601, 103D.605, 103D.611, or 103D.730. (Guidelines for creating water management districts)
§103D.901	Watershed districts	County auditors assess the amount specified in an assessment statement filed by managers. The county may issue bonds (§103E.635). An assessment may not be levied against a benefited property in excess of the amount of benefits received.
§103D.905 Subdivisions 2,3, 7-9	Watershed districts	Established funds for watershed districts (not a complete list – see full statute language): **Organizational expense fund** - consisting of an ad valorem tax levy, shall be used for organizational expenses and preparation of the watershed management plan for projects. **General fund** - consisting of an ad valorem tax levy, shall be used for general administrative expenses and for the construction or implementation and maintenance of projects of common benefit to the watershed district. May levy a tax not to exceed 0.00798 percent of estimated market value to pay the cost attributable to projects initiated by petition. **Repair and maintenance funds** - established under §103D.631, Subd. 2. **Survey and data acquisition fund** - consists of the proceeds of a property tax that can be levied only once every 5 years and may not exceed 0.02418 percent of estimated market value. **Project tax levy** - a WD may levy a tax: 1. To pay the costs of projects undertaken by the WD which are to be funded, in whole or in part, with the proceeds of grants or construction or implementation loans under the Clean Water Partnership Law; 2. To pay the principal of, or premium or administrative surcharge (if any), and interest on, the bonds and notes issued by the WD pursuant to §103F.725; 3. To repay the construction or implementation loans under the Clean Water Partnership Law.
§103E.011 Subdivision 5	Drainage authorities	A drainage authority can accept and use external sources of funds together with assessments from benefited landowners in the watershed of the drainage system for the purposes of flood control, wetland restoration, or water quality improvements.
§103E.015 Subdivision 1a	Drainage authorities	When planning a "drainage project" or petitioned repair, the drainage authority must investigate the potential use of external sources of funding, including early coordination for funding and technical assistance with other applicable local government units.
§103E.601 §103E.635 §103E.641	Drainage authorities	Funding of all costs for constructed "**drainage projects"** are apportioned to benefited properties within the drainage system pro rata on the basis of the benefits determined (§103E.601). After the contract for the construction of a drainage project is awarded, the board of an affected county may issue bonds of the county

Citation	Applies to	Summary *(please see details in the full text of each provision)*
		in an amount necessary to pay the cost of establishing and constructing the drainage project. (§103E.635). Drainage authorities may issue drainage funding bonds (§103E.641).
§103E.728 §103E.731 §103E.735	Drainage authorities	Costs for drainage system **repairs** are apportioned pro rata on all benefited properties of record. The drainage authority may charge an additional assessment on property that is in violation of §103E.021 (ditch buffers) or a county soil loss ordinance (§103E.728). If there is not enough money in the drainage system account to make a repair, the board shall assess the costs of the repairs on all property and entities that have been assessed benefits for the drainage system (§103E.731). To create a repair fund for a drainage system to be used only for repairs, the drainage authority may apportion and assess an amount against all property and entities benefited by the drainage system, including property not originally assessed and subsequently found to be benefited according to law. (§103E.735).
Chapter 287	Counties	Counties participating in the agricultural land preservation program impose a fee of $5 per transaction on the recording or registration of a mortgage or deed that is subject to tax under §§287.05 and 287.21.
Chapter 365A	Towns	Townships may create subordinate service districts with special taxing authority. Requires a petition signed by at least 50 percent of the property owners in the part of the town proposed for the subordinate service district.
§373.475	Counties	A county board must deposit the money received from the sale of land under Laws 1998, chapter 389, article 16, section 31, subd. 3, into an environmental trust fund. The county board may spend interest earned on the principal only for purposes related to the improvement of natural resources.
Chapter 429	Municipalities	May levy special assessments against properties benefitting from special services (including curbs, gutters and storm sewer, sanitary sewers, holding ponds, and treatment plants).
§444.075	Municipalities	May collect stormwater utility fees to build, repair, operate & maintain stormwater management systems.
§462.358 Subdivision 2b(c)	Municipalities	May accept a cash fee for lots created in a subdivision or redevelopment that will be served by municipal sanitary sewer and water service or community septic and private wells. May charge dedication fees for the acquisition and development or improvement of wetlands and open space based on an approved parks and open space plan.
M. L. 1998, Chapter 389 Article 3, Section 29	Red River Watershed Management Board	Watershed Districts that are members of the Red River Watershed Management Board may levy an ad valorem tax not to exceed 0.04836 percent of the taxable market value of all property within their district. This levy is in excess of levies authorized by §103D.905.